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The Mining Journal

LONDON, DECEMBER 2, 1960

Vol. 255. No. 6537.

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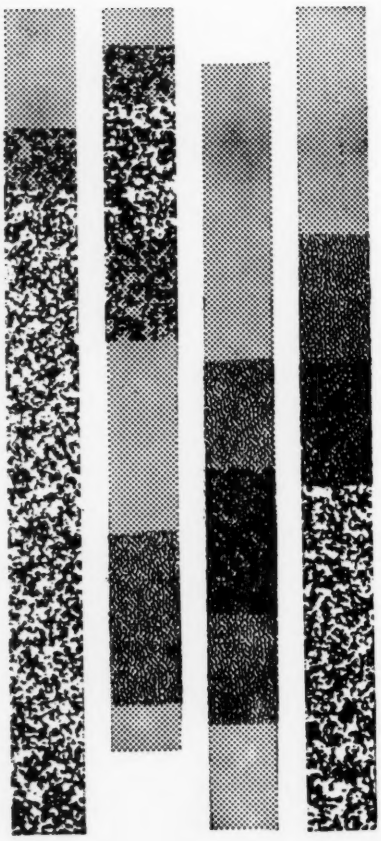

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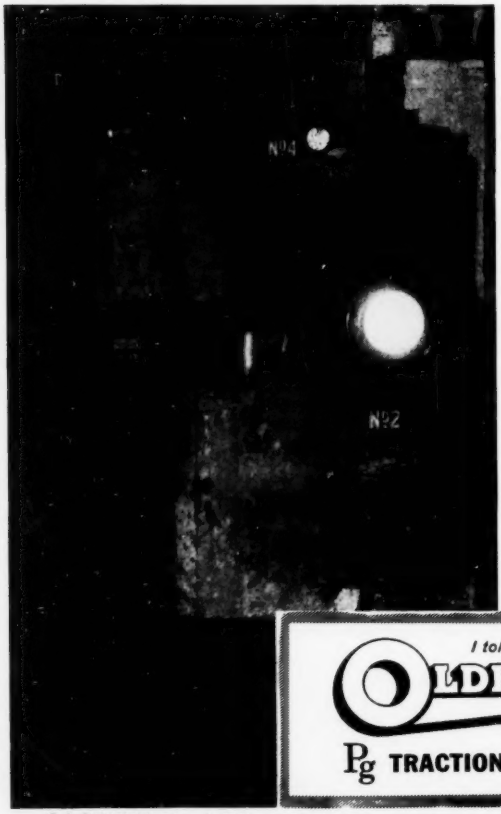

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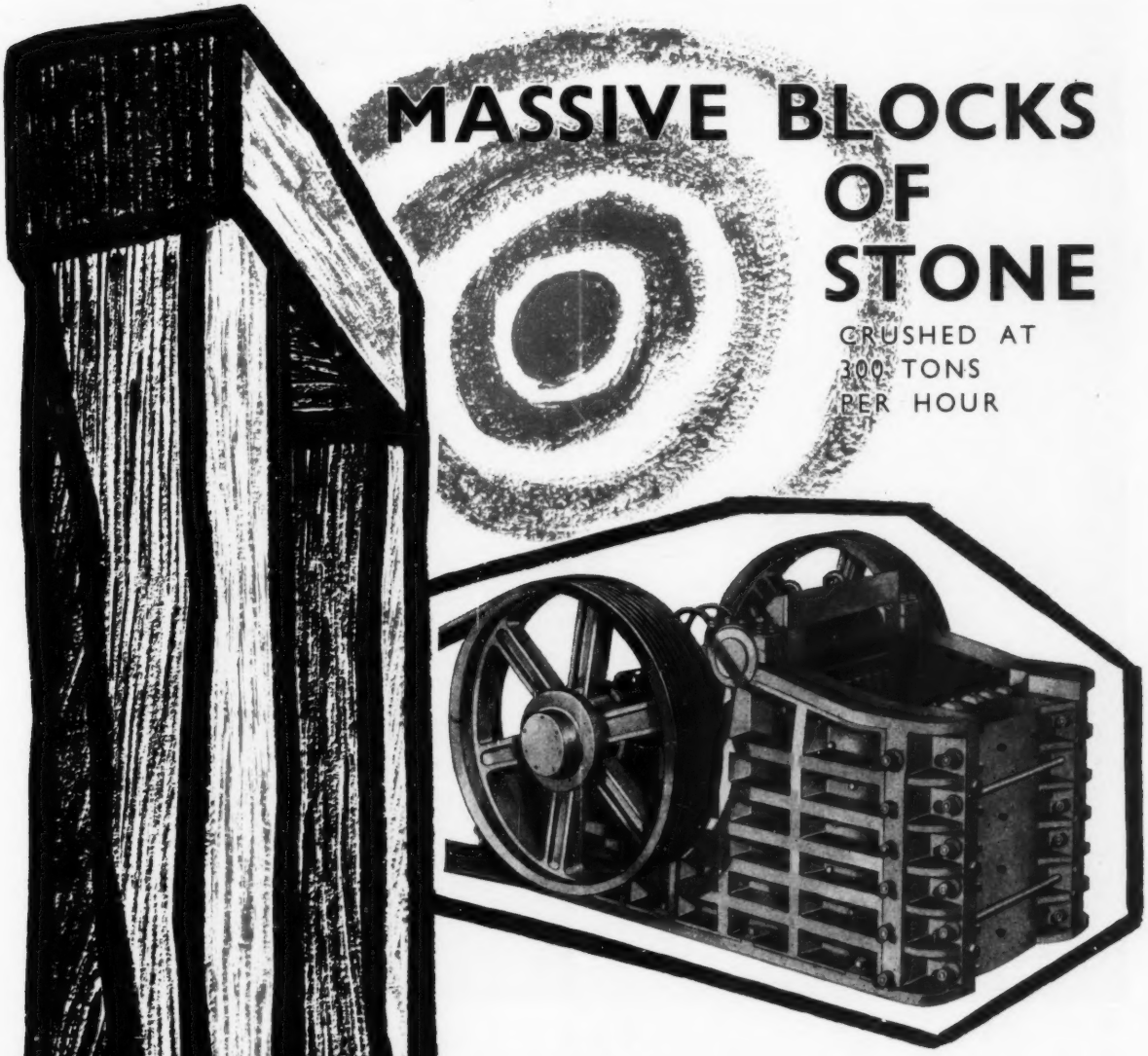

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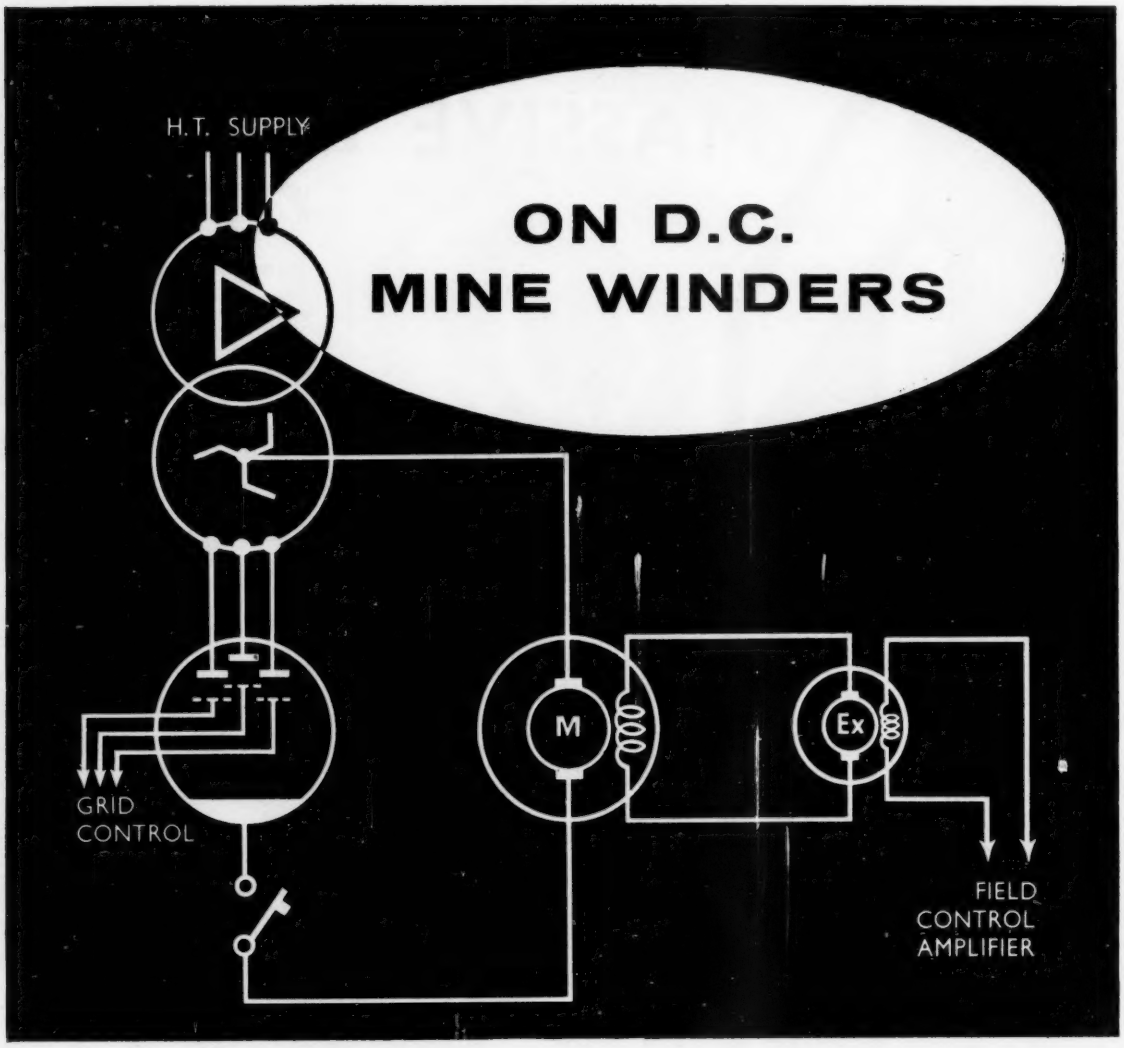

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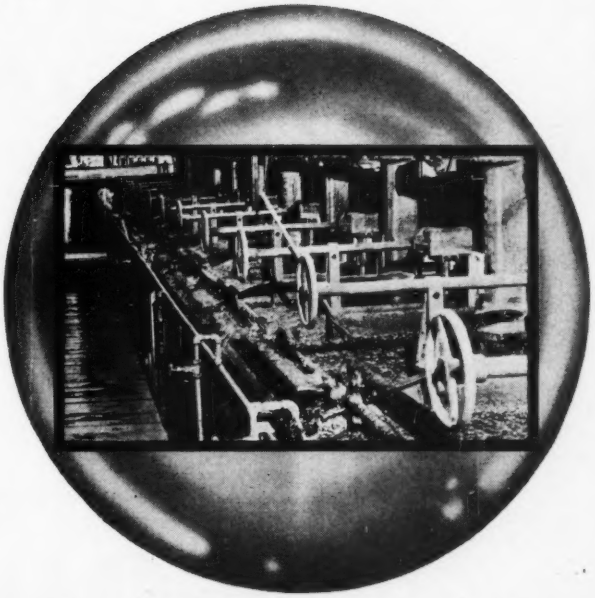

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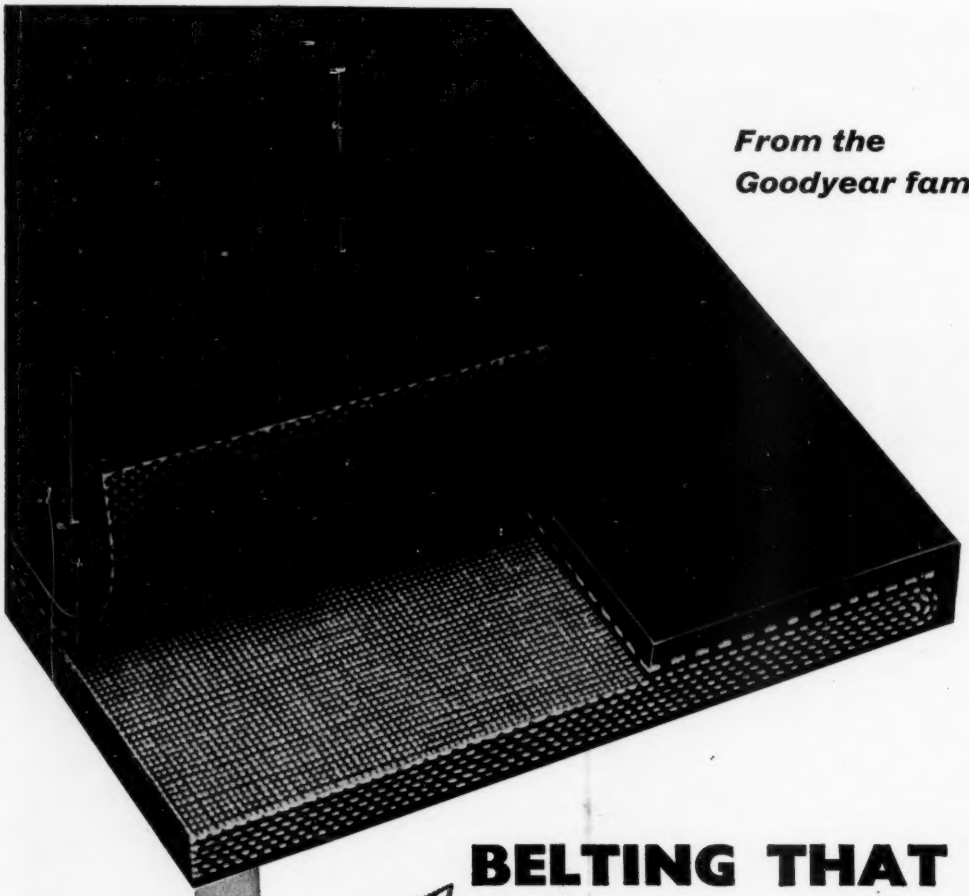

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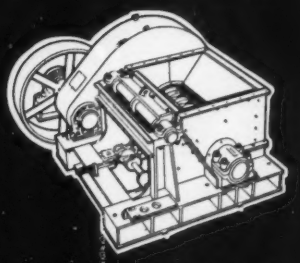

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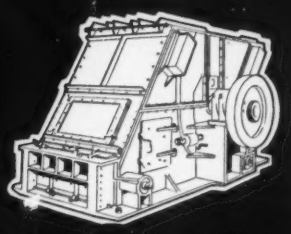
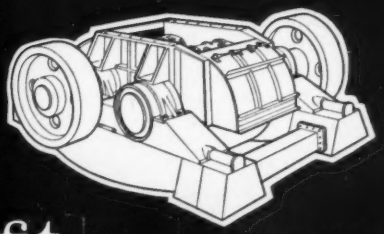


CRUSHING ROLLS



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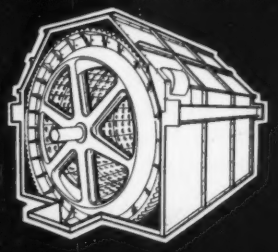

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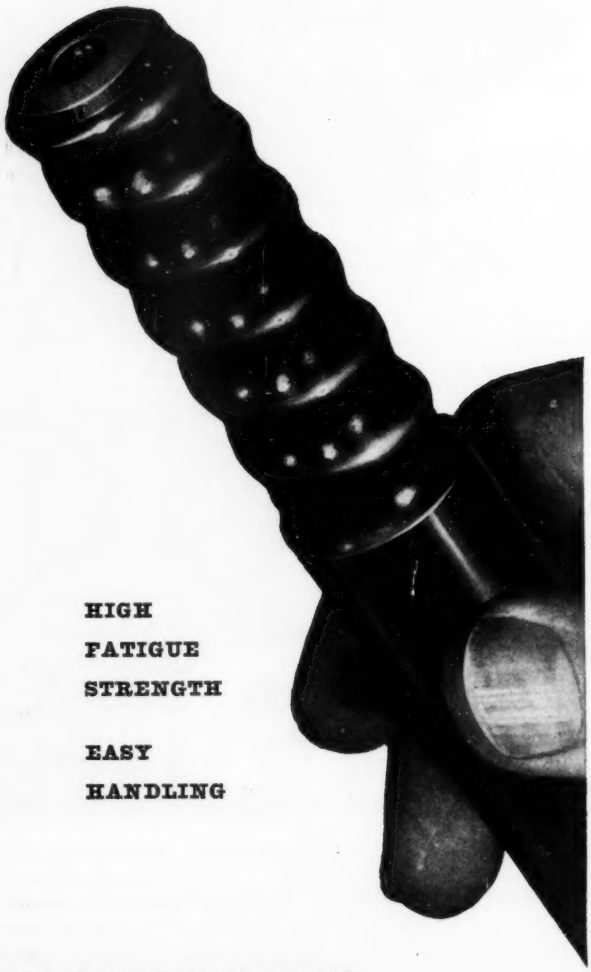

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The Mining Journal

London, December 2, 1960

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How Much Aluminium Can Australia Sell?

THE announcement last week that Consolidated Zinc Corporation had decided to proceed with the establishment of an aluminium smelter in New Zealand has been followed by the further news that Kaiser Aluminum and Chemical Corporation is to be associated with the British company as an equal partner in the development of an integrated aluminium industry in Australia and New Zealand, embracing the production of alumina and aluminium, and, in addition, the establishment of fabricating facilities.

Under the agreement whereby the partnership between Consolidated Zinc Corporation and British Aluminium was recently terminated, Consolidated Zinc became the owner of the entire capital of the Commonwealth Aluminium Corporation Pty. Ltd., the company formed by the two former associates for the development of an aluminium industry in Australia. Subject to the necessary government consent, Consolidated Zinc's shares in Comalco will be transferred to a new Australian company in which Kaiser Aluminium will take up a 50 per cent interest. Consolidated Zinc's two-thirds interest in the new company to be formed in accordance with its recent offer to purchase and expand the Bell Bay smelter in Tasmania and the rights granted to Consolidated Zinc by the New Zealand Government in regard to the hydro-electric power potential of the Manapouri-Te Anau Lakes system will similarly form part of the new joint association.

Thus Consolidated Zinc brings to the partnership the raw materials contributed by Comalco and the benefit of the preliminary work carried out over the past three years in planning for the development of the aluminium industry in Queensland, Tasmania, and the Southland Province of New Zealand, in the course of which close relations have been established with the Australian and New Zealand Governments. Kaiser contributes its technical knowledge and experience gained in all phases of the industry from the mining of bauxite to metal production and fabrication, together with a world-wide marketing and product development organization. The financial arrangements are discussed on page 639.

The major items in the integrated project are bauxite mining facilities, a 360,000 t.p.a. alumina plant with associated facilities at Weipa in Queensland, the Manapouri power project, and a 120,000 ton aluminium reduction plant at Invercargill in Southland, New Zealand.

Pre-construction work is to be put in hand immediately with the agreed objective of having the overall project in operation by mid-1966. At Weipa this will require the dredging of a shipping access channel to a port to be constructed adjacent to the new alumina plant, the provision of temporary accommodation and other services, and the planning of a new township. Work will also proceed in New Zealand at the port of Bluff near Invercargill to select a site for the new smelter and to develop further port facilities.

The smelter will draw power from the first stage of a hydroelectric development to utilize the waters of Lakes Manapouri and Te Anau, which lie about 80 miles to the north-west of Invercargill. This first stage will provide capacity of 280,000 kW., but it is estimated that this initial output could be at least doubled by further development. This would allow aluminium production in Southland to be raised eventually to some 250,000 t.p.a., as compared with the present target of 120,000 tons. Preconstruction drilling and pilot plant shaft sinking will begin at once at the Manapouri site. Detailed design work for the power project will be completed by the end of 1961, and construction will follow early in 1962.

Coincident with the Queensland and New Zealand developments, expansion of the Bell Bay aluminium smelter in Tasmania, to a capacity of at least 28,000 tons per annum will begin early in 1961. At the beginning of September it was announced that the management of this plant was to be taken over by Comalco. The programme agreed by Consolidated Zinc and Kaiser Aluminium provides for continued studies of the possibilities of additions to Australia's domestic smelting capacity by further expansion of Bell Bay, and by the utilization of thermal power from the coal resources of Queensland and certain other areas. An ultimate capacity of 40,000-50,000 tons for Bell Bay was mentioned in the September announcement. However, it would appear from the latest statement that a possible alternative to the final stage of expansion at Bell Bay might be the establishment of a new smelter based on the Blair Athol coalfield on the east coast of Queensland, which was one of the possible sources of power under investigation by Consolidated Zinc.

The decision to proceed with the establishment of a large integrated aluminium industry in Australasia has been taken at a time when world capacity is considerably in excess of present needs. Free World consumption, however, is expected to rise very rapidly. According to a recent prediction by Mr. N. V. Davis, president of Aluminium Ltd., it should reach at least 5,500,000 tons a year by 1965. Mr. Davis coupled his forecast with the warning that world production capacity would at least equal that total, or, if other contemplated expansion programmes were embarked upon "too quickly with too little regard for reality", could even surpass 7,000,000 tons.

In terms of existing Free World production, an annual output of 120,000 tons would make New Zealand the sixth largest aluminium producer. By 1966, however, when the Southland smelter is scheduled to be in operation, such an output would represent little more than 2 per cent of the world total, based on Mr. Davis's predicted figure for 1965.

Moreover, there are cogent reasons for the development of an aluminium industry in Australasia, irrespective of the world position. Not least of these, of course, is the availability of the largest known bauxite resources in the world. The deposits discovered by Consolidated Zinc in 1955, at Weipa, Northern Queensland, are as yet by no means fully explored, but the proved reserves alone are capable of supporting Free World aluminium consumption at the present level for about fifty years. Alcan holds rights over further bauxite deposits in the Cape York Peninsula, though these are smaller in extent. In addition, it will be recalled that when British Aluminium withdrew from Comalco it retained its mineral rights on bauxite deposits in the Northern Territory on the other side of the Gulf of Carpentaria. Presently indicated reserves throughout Australia exceed 1,115,000,000 tons.

A major consideration has, of course, been that of power for the enterprise. The company's investigations of potential sources of supply have extended from Queensland to New Zealand and Papua and even as far afield as Canada and the United States. It is anticipated that the power costs of the Manapouri project will be, if anything, lower than those of many hydro-electric schemes in North America. A further advantage is that, in contrast to, for example, Kitimat and Kariba, where dam construction was a major item of the capital programme, it will not be necessary for the whole project to be in operation before minimum unit costs are achieved.

Apart from the advantages of accessibility to unlimited bauxite resources and an abundance of low-cost power, the new smelter is ideally situated to serve the markets which are rapidly developing in the Pacific area, both in Australia itself and in the East. Mr. D. A. Rhoades, president of Kaiser Aluminium, anticipates that consumption in the Pacific area will have more than doubled by 1970.

So far as Australia itself is concerned, a survey undertaken recently by the Department of Trade indicated that consumption of primary aluminium in 1965 could rise to 47,000 tons — nearly double the 1957-58 consumption. Hitherto, the chief factor limiting expansion has been the inadequate and high-priced supply of domestic metal. Once this handicap has been removed by the provision of additional capacity at Bell Bay and the construction of the new smelter in Southland, the growth of consumption may be expected to become increasingly rapid. As Dr. J. A. Dunn pointed out in a paper presented in Brisbane last year (*The Mining Journal*, October 2, 1959, pp. 315 and 316), Australia's consumption per head is amongst the lowest of the Western countries. To be comparable with that of the West European countries and Canada, Australia should use 40,000 tons of aluminium a year, while a *per capita* rate equal to that of the United States would raise annual consumption to 80,000 tons. Given market promotion on a par with the drive in America in the past ten years, Dr. Dunn considers that a rise of consumption in Australia to 100,000 tons annually by the 1970's would not be out of balance.

It is evident, however, that in planning for an initial capacity of 120,000 tons at the Southland smelter, the two company partners are providing for a large exportable surplus, for which South-East Asia would appear to be the most promising outlet. In the past the Eastern markets have not been very intensively exploited by any of the major aluminium producers, all of whom have now begun to take a much more active interest in this part of the world. Consolidated Zinc itself has been exploring the Japanese market this past year, but it may well be that ultimately the greatest opportunities will be presented by the underdeveloped countries, where the *per capita* consumption of metals is still extremely small. Aside from Japan, itself a net importer, the Southland smelter will be the first relatively large source of aluminium within striking distance of the Eastern market, a fact which may well have played no small part in influencing Kaiser's decision to participate in this undertaking.

The possibility of finding further outlets for Weipa bauxite will doubtless be vigorously explored by the partnership. The potential overseas markets for Australian bauxite were discussed in Dr. Dunn's paper and the view was expressed that, in competition with Indonesia, Malaya and India, there might be a certain amount of business with Japan. Within the space of the 1960's, Dr. Dunn could see no market for Australian alumina in Europe, unless political problems in Africa were to inhibit or delay the development of the larger projects there. In the latter part of the 1960's and early 1970's, however, Australian alumina could well be competitive with alumina from the Caribbean and perhaps from India and even Communist countries. It was also considered reasonably possible that Australian alumina could prove competitive in the Ameri-

can Pacific Coast market, taking into account Panama dues on Caribbean alumina and rail freights between alumina plants at U.S. Gulf ports and the North - West States. In view of Kaiser's participation in the development of the Weipa deposits, it would not be surprising if consideration were given to this possibility at a future date.

The partnership plans to spend roughly £100,000,000 in Australia and New Zealand in six years, including £1,000,000 already expended. In the words of Mr. Rhoades, the installation of new industrial facilities and the development of bauxite and hydro resources will make a substantial contribution to the economic growth of both countries. In addition to the benefits created by this expansion, the availability of aluminium in the area will stimulate the development of many new fabricating operations in both countries.

The construction of the Weipa and Southland plants, together with the associated undertakings, will, of course, involve the importation of large quantities of specialized plant and equipment, for much of which British manufacturers should be in a favourable position to tender.

ASSISTANCE FOR PHILIPPINE PRODUCERS

Philippine gold producers recently petitioned the Monetary Board of the Central Bank to grant them exemption from the 25 per cent margin fee in the purchase abroad of their import requirements. Hit by the recent sharp drop in the peso price of gold, the mine-owners claimed that relief was necessary to avert closure. The producers indicated that a recent offer of the Monetary Board to allow them to retain, without conversion into pesos, 90 per cent of their dollar receipts, would not answer their needs.

On November 2 it was announced that a programme of government assistance for the Philippine gold mining industry had been approved by the Monetary Board. It provides that 10 per cent of the local gold produced will be bought by the Central Bank at the free market rate of 3.75 pesos to the dollar, representing a basic rate of 3 pesos plus the 25 per cent margin fee. Producers will be allowed to use the remaining 90 per cent of their gold production to import goods in the non-essential consumer (NEC) and non-essential producer (NEP) categories.

The Central Bank estimates that the system will give the gold producers an increase of about 10 per cent over their present income.

Philippine base metal producers have once more sought the assistance of Agriculture and Commerce Departments in meeting some of their urgent problems. Writing to the Department of Agriculture and Natural Resources, the Base Metals Association proposed three areas of assistance :

(a) amendment of the present mining law and the corporation law to make the mining industry more attractive to new venture capital;

(b) granting of dollar allocations to base metal producers at the preferential rate of exchange to cover their import requirements and enable them to reduce operating costs;

(c) revision of the tax rates imposed on the industry to ease the present tax burden on major dollar producers and enable the Philippine industry to compete in the Japanese market.

Seibei Ishii, director and manager of the foreign division of the Fuji Bank, Japan's largest commercial bank, stated recently in Manila that he was looking into the possibility of investing in iron ore mining in the Philippines.

COAL OUTLOOK BRIGHTER

Representatives of sixteen European coal producing countries, together with delegates from the United States, meeting in the Coal Committee of the United Nations Economic Commission for Europe (E.C.E.) have recently reviewed the current coal situation and have decided to undertake a number of joint studies on problems facing the various coal industries. Meeting in Geneva the delegates gave accounts of each country's coal industry and examined an overall report on investments and costs of production of particular types of coal. The Committee decided to extend this work to cover particular aspects of these problems, including a comparison of investments required for reconstruction of mines and the concentration of workings and mechanization of mining operations. This getting together of the major coal producing countries cannot but do good, and the pooling of ideas may well help towards a clearer understanding of the coal situation and provide a workable solution to the problems facing the industry.

Although any benefit resulting from international co-operation on this scale will not be effective for several years, there appears to be a perceptible improvement in the current coal situation. Despite the fact that all European countries still have embarrassingly high stocks of unsold coal, Britain this year expects to have a reduction in stocks of some 5,000,000 tons. Within the Community, too, stocks are going down despite the fact that during the first nine months of the year Community production at 174,340,000 tonnes was slightly up on last year.

Things are on the mend, too, in the United States, and a recent forecast by American market analysts must have done something to dispel the worries of American coal producers. For the first time since 1956 production figures are rising and according to the market forecasts this increase in the rate of production will continue. It is estimated that production of bituminous coal in 1960 will be some 420,000,000 tons.

Although things are not quite as good as they could be in coal, recent experience suggests that the industry may be climbing out of the trough.

CONCESSIONS TO NON-NORWEGIANS

A Royal Commission, which since 1956 has been reviewing the Act regulating the acquisition by foreigners of natural resources and real estate in Norway, has now submitted its report. Its recommendations in part mark an important move away from the present special and strict limitations for the granting of concessions to non-Norwegians. The view of the Commission is that the time has come for a change towards the greatest possible equality between Norwegian and foreign persons and institutions in this respect, because it may be to Norway's advantage to give scope to foreign capital interests—under government control.

Also as far as mining rights are concerned the Commission wants to make the position more equal for foreigners and Norwegians but by a reversed process, by imposing the same restrictions on Norwegians as are at present limiting foreigners only. If accepted, this means that anyone who wants to carry on mining activities will be dependent on government concessions.

The present legislation does not require that mining companies should have registered offices in Norway, and no such rule is suggested, but the chairman and the majority of the board should be Norwegian, in the view of the Commission.

Lake View & Star Celebrates Golden Jubilee

THE varying fortunes of the gold mining industry in Western Australia and the events which have led to the emergence of Lake View and Star Ltd. as Australia's largest gold producer are well described in a brochure published by the company, entitled "Fifty Historical Years", on the occasion of the company's Golden Jubilee which falls this year.

Founded in London in 1910 to acquire the properties and assets of Lake View Consols Ltd. and Hannans Star Consolidated Ltd., two companies which had been associated with the Golden Mile in Kalgoorlie since 1895, Lake View and Star Ltd. felt the disrupting effects of the first world war and the 1920s, which provided a combination of rising costs, the falling grade of ore and a fixed price for gold. Thanks, however, to the optimistic and constructive outlook of the then chairman, Mr. A. H. Collier, and his colleagues, and the forward-looking measures taken, production more than trebled in 1926 from an all-time low in 1924. Although the Ivanhoe Mine, acquired in 1923, also proved to be rich, the costs of reconciliation and expansion operations were to preclude the resumption of dividend payments until 1932.

In the meantime, in 1928, Mr. John A. Agnew and Mr. G. Goldthorp Hay, both future chairmen, were elected to the Board, and, through the influence of Mr. Agnew, New Consolidated Gold Fields Ltd. provided additional capital for the development of the Chaffers lease, where two rich lodes, previously worked by the Golden Horse Shoe Estates Co. Ltd., on their adjacent property were confirmed. An even more favourable position was reported by Dr. Malcolm Maclaren who examined both the Lake View and Golden Horse Shoe workings and this led to the latter company being acquired by Lake View and Star in 1929.

Under modernization, production rose rapidly until, by 1932, the low 1924 figures had been increased tenfold, despite the generally depressed state of gold mining in Western Australia. One of the steps taken was to install the first flotation plant for concentrate production on a practical scale, thereby pioneering a system which enabled mines treating refractory ores to operate economically.

In 1930, the devaluation of the Australian currency to £A. 125 = £100 sterling and the Government Gold Bounty of £1 per fine ounce both served as an initial stimulant, though the Bounty was later suspended and then repealed.

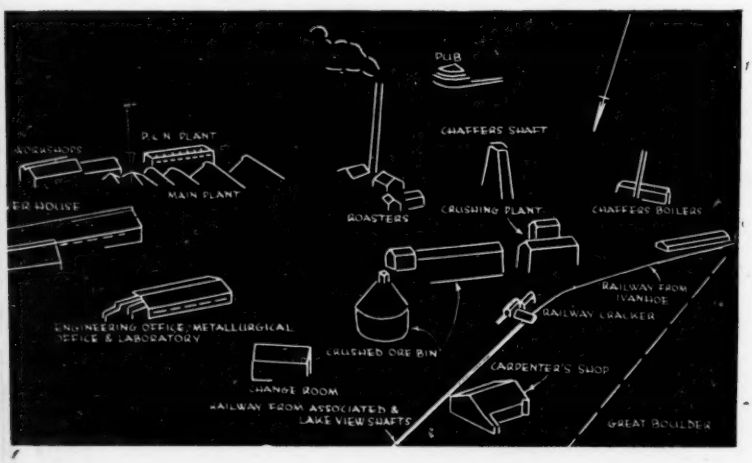
When, in 1931, Great Britain moved off the Gold Standard, Lake View and Star was at the forefront of a new wave of prosperity on the Golden Mile.

In 1932, the company decided to generate its own electricity and a modern diesel plant was installed and, together with a compressed air plant, has since been expanded.

Representing the last of a long series of amalgamations, the acquisition of the assets and leases of The Associated Gold Mines of Western Australia (New) Ltd. was to result in the emergence of the Lake View and Star as the largest gold producer in Australia with profits passing £500,000.

In 1940 the Chaffers retreatment plant came into operation which dealt with some 4,000,000 tons of residues left from bygone working, at a profit of nearly £330,000.

Peak production in 1941 was followed by wartime decline and curtailed production and development due to labour shortage. During this period Mr. G. Goldthorp Hay became chairman of the company. Impending post-war stagnation was considerably alleviated by the foresight and planning of Mr. J. F. Thorne, the general manager, but unsettled labour conditions and materials shortages, as well as rising costs, thwarted development. The strain was eased in 1949 by the devaluation of the pound sterling but wage inflation began to have its detrimental effect and called for further modernization and mechanization underground.



The surface workings at Chaffers Shaft, Lake View and Star. Above is a general view of the area, while the explanatory chart appears alongside, at left

In 1950, Sir Joseph Ball, K.B.E., a director of The Consolidated Gold Fields of South Africa Ltd. and a well-known figure in mining circles, became chairman of the company and Mr. R. J. Agnew, a son of Mr. J. A. Agnew, became general manager

Electrification of the shaft winders resulted in great savings in costs, though the still upward trend of the latter caused the Board to seek Treasury consent to transfer the domicile of the company to Australia to ease taxation. This step, however, proved unnecessary when, in 1957, the company was successful in qualifying as an Overseas Trade Corporation.

During the 1950s production continued to rise to reach an all-time record of 763,538 tons of ore and 164,884 oz. of gold in the year ended June, 1960. Today, Lake View and Star covers a mining lease area of 884 acres, worked to a depth of 3,670 ft. and served by six main shafts. The company also owns 26 tailings leases covering 496 acres. Over 5,500,000 ounces of gold, yielding nearly £45,000,000, have been produced from 20,000,000 tons of ore, while the ore reserve still stands at over 3,500,000 tons.

It is sad to record the death of Mr. R. J. Agnew, director and general manager. Mr. R. C. Buckett, assistant general manager, has succeeded him.

The Swedish Ladder Drilling Method

INTRODUCED originally by Widmark and Platzer, one of Sweden's leading contracting companies, and since developed both by them and the Swedish State Power Board, the ladder drilling method is now being adopted for tunnel work in a number of countries.

The method combines the advantages in flexibility of the pusher-leg drill with the accuracy of alignment and labour-saving qualities of boom-mounted machines. Equipment comprises a standard lightweight rock drill and retractable pusher-leg mounted in line on a narrow pre-fabricated steel ladder (see Fig. 2), which in turn is mounted on two horizontal arms carried on a drilling platform. (See Fig. 1.) When necessary, a machine can be removed from its ladder simply and quickly and used in the normal manner as a pusher-leg drill. Compared with hand held pusher-leg drilling, higher drilling rates are stated to result from the in line arrangements of machine and pusher; one man can operate at least two rock drills and fatigue is greatly reduced since there is no need for the operator to manhandle the rock drill; longer steels can be used requiring fewer steel changes, and both collaring and direction are more exact. (See Fig. 3.)

In normal use, each ladder-mounted machine drills a series of holes in a single near-horizontal plane, one disadvantage of the method being the comparative difficulty of raising or lowering the ladder supporting arms to alter the inclination or elevation of the plane. Special arrangements are also required for drilling cambered profile holes.

Using the ladder drilling method in a 10 mile 650 sq. ft. tunnel at Stalon, the Swedish State Power Board are using 16 to 17 Atlas Copco "Lion" machines operated by 8 men from a drill carriage, the upper deck of which may be raised or lowered hydraulically for drilling the back holes. These 8 men per shift carry out all operations, including charging up and blasting, scaling, mucking and driving the rubber-tyred disposal trucks, in a 3-shift continuous operation. The advance per round is approx 15 ft. and the average daily advance 31 ft. (2.1 cu. yds. of solid rock/man hour drilled, blasted and removed).

Fig. 1. Mounting of the ladders on their fore and aft beams. Ladders can be swung through an arc to allow for drilling at various angles

Fig. 3. Drill steel support for collaring

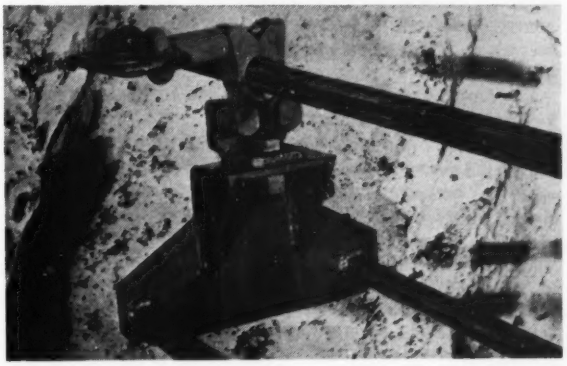
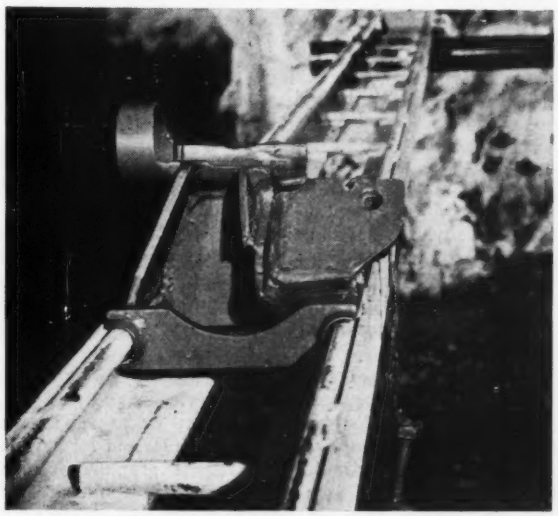


Fig. 2. Cradle of the ladder drilling rig. Pin bolt used to hold the drill is extracted. The guides and rungs of the ladder are made of steel tube



Graphite as a Strategic Mineral

The nature, commercial grades and uses of graphite are reviewed in "Strategic Graphite, a Survey", by Eugene N. Cameron and Paul L. Weis, issued by the U.S. Government Printing Office, Washington as Geological Survey Bulletin 1082-E. The bulk of the report consists of an appraisal of U.S. domestic graphite resources, with brief descriptions of those domestic deposits that are of actual or potential importance as sources of strategic graphite

THREE principal commercial types of natural graphite are recognized on the basis of their physical properties. They are lump and chip, flake and amorphous. Each has one or more characteristic modes of occurrence.

Lump and chip graphite occur in veins cutting igneous or metamorphic rocks, as illustrated by the deposits of Ceylon. Ceylon graphite forms masses consisting of coarse, platy intergrowths of fibrous or needlelike aggregates. It breaks into spear-shaped or irregular, sharp-cornered pieces composed of interlocking crystals or crystal fragments that are denser and tougher than other types of graphite. Commercial grades of Ceylon graphite are classified according to size and purity. Lump graphite is described as consisting of pieces ranging from the size of a walnut to that of a pea. It usually contains 90 per cent or more carbon. Chip graphite ranges from the size of a pea to a little less than the size of a wheat grain, it is usually 90-92 per cent carbon. "Dust" consists of fines, about 40 to 60-mesh size, and contains from 55 to 90 per cent carbon.

Flake graphite occurs in metamorphic rocks, particularly in schists. The flakes range from a fraction of a millimeter to more than 2.5 cm. in diameter; the average is probably 5 mm. or less. Thickness, toughness, density and shape vary from one deposit to another. Flake graphite also occurs in contact-metamorphic and contact-metasomatic deposits in marble. Most commercial grades contain a minimum of 85 per cent carbon.

Amorphous graphite is extremely fine grained and individual flakes are distinguished only with the aid of a microscope. The term "amorphous" is a misnomer, for all true graphite is crystalline. Amorphous graphite is found in a variety of geological environments, including those that yield flake and lump. Much of the production, however, is from coal seams that have undergone thermal metamorphism by nearby intrusive bodies. Its purity depends largely on that of the original coal seam. Material averaging 80-85 per cent graphite has been mined in Mexico. Commercial grades are generally about 85 per cent carbon.

Amorphous graphite is also manufactured by an electric furnace process and marketed as "artificial" graphite. Manufactured amorphous graphite of extremely high purity can be produced.

Uses

Owing to its unique physical and chemical properties, graphite has become an essential constituent of a wide variety of manufactured articles. It is also used in several processes without entering into final products. Its softness, opacity, thermal and electrical conductivity, resistance to chemicals and heat, and ability to form a clinging film on metallic surfaces, make it ideal for many purposes. The various commercial types of graphite differ in properties and find favour in different uses, but are interchangeable to some extent.

The principal uses of flake graphite are for crucibles and related refractory articles, for lubricants and packings, for batteries, and for foundry facings; the principal uses of lump and chip graphite are for crucibles and for carbon brushes and other articles that require graphite of high purity; the principal uses of amorphous graphite are for foundry facings, batteries, pencils, paints and polishes.

Flake, lump and chip graphite for crucibles, lubricants and packings, and carbon brushes is derived largely from sources outside North America. These types constitute the strategic grades.

The importance of graphite in industry is not measured in tons. Ordinarily, less than 5,000 tons of graphite of strategic grade is required annually by the industries of the U.S.; yet the elimination of this small tonnage would have far-reaching effects in several industries. Lump, chip, and flake graphite is therefore regarded as being of great strategic importance.

World Production

The annual world production of graphite (excluding Russia and China) ranges between 120,000 and 270,000 l.tons. Two peaks of production were reached during the First and Second World Wars, and the highest production of all time was reached in 1943. After both wars there was a precipitous drop in production. A steep rise in 1955, from 120,000 to 210,000 tons was due largely to increased production from Korea. In 1957 world production totalled 270,000 tons. In 1958 it was about 200,000 l.tons.

Over the long run there have been marked changes in the proportion of graphite produced by various countries. Annual production from the Ceylon deposits, discounting the ups and downs that characterize the curve for world production, was around the same from about 1939 to 1944 but declined in 1945 and has not regained its previous level. Production from the deposits of Madagascar, which began about 1910, reached its peak during the First World War and a lesser peak in the 1920's, but has since remained at a moderate level, only rarely exceeding 15,000 tons. The graphite industry in Czechoslovakia, important until 1930, virtually ceased production during the depression of the 1930's. It was revived by Germany during the Second World War but apparently has been dormant since 1948. Bavarian production has diminished in importance but Austria has regained her pre-World War II position as a leading producer. Coincidental with these declines in output from the earlier established sources, there has been a marked increase in production from Korea and some increase in production from Mexico.

Production from Austria, Bohemia, Mexico, Italy and Korea is mostly amorphous graphite; from Bavaria and Madagascar mostly flake; production from Ceylon includes a significant amount of flake in addition to lump and chip types. Since Germany normally consumes most of the Bavarian product, only Ceylon and Madagascar have been important in world flake markets.

Factors Influencing World Production

Ordinary competition among sources, as between Madagascar and Ceylon, and Korea and Mexico, has partly determined the proportions of the world market held by each country. Political developments, however, have had a heavy hand. The unsettled conditions and dismemberment of political units in Europe after each of the two world wars have, in general, adversely affected production from Bavaria, Bohemia, Italy and Austria for varying periods. The graphite industry of Europe received a considerable stimulus under the Hitler regime. Korean production under the Japanese occupation has since been exceeded only in 1955.

In all countries production has been strongly influenced by general economic conditions. Exhaustion of reserves does not appear to have been a heavy factor, though undoubtedly the best deposits in those countries that have been producing for long periods have been wholly or partly depleted. Conditions in Ceylon and Madagascar, the sources of greatest strategic importance, are of special interest. Production in Ceylon is restricted only because of the limited demand. Reserves are thought to be large and there is an ample labour supply. The situation in Madagascar is rather different. Reserves in that country are believed to be almost limitless, but it does not necessarily follow that production there can readily be expanded to meet unusual demands.

This became apparent during 1945-49, when, although the demand for Madagascar graphite was at a record level, production increased only after 1948 and did not attain the pre-war peak level until 1951. There were several reasons : An abortive rebellion in 1947 resulted in destruction of machinery and equipment at some of the principal mines, and a typhoon in 1948 damaged the railway over which graphite is shipped to the east coast port of Tamatave. A further difficulty, and one that has not been solved, is a shortage of labour. A final factor probably is the reluctance of the producers to see a rapid expansion that might prove to be over-expansion if there were a drop in world demand. Such a drop is not unlikely once stockpiling requirements are met and demand from that source declines.

Changes in the U.S. domestic graphite-consuming industry have influenced foreign production. The use of Madagascar flake for crucibles adversely affected production from Ceylon. The rise in world consumption of amorphous graphite greatly stimulated production from Korea and Mexico and, for a time, production from European sources as well.

U.S. Domestic Resources

Graphite of various grades has been produced intermittently in the U.S. since 1944. The principal domestic deposits of flake graphite are in Texas, Alabama, Pennsylvania and New York. Reserves of flake graphite in these four States are very large but production has been sporadic and on the whole unprofitable since World War I, owing principally to competition in Madagascar, where production costs are low and the flake produced is of high quality. In addition, the usability of Madagascar flake for various purposes has been thoroughly demonstrated, whereas the usability of U.S. domestic flake for strategic purposes is still in question.

There have been indications that flake graphite from Texas, Alabama and Pennsylvania can be used in clay-graphite crucibles as a substitute for Madagascar flake, and one producer has made progress in establishing markets for his flake products as ingredients of lubricants. The tonnages of various commercial grades of graphite recoverable from various domestic deposits, however, have not been established.

The only vein deposits from which significant quantities of lump graphite have been produced are those of the Crystal Graphite mine, Beaverhood County, Mont. The known reserves are small.

U.S. production reached its peak of nearly 13,600 tons in 1917. Both total production and production of strategic grades then declined irregularly until 1932. In that year and until 1942 total production was only a few hundred tons annually. In 1942, World War II brought about a revival of the industry and production rose to a peak of 9,016 tons in 1943. After declining from 1944 to 1947, output increased sharply to 9,026 tons in 1948. Thereafter it again declined and in 1953 was recorded at about 5,000 tons.

Factors Affecting U.S. Production

The principal factors which have contributed to the irregularity of U.S. production have been competition from low-cost sources abroad, inability of single mines to produce a wide variety of acceptable grades, limitations of the market, inability of individual producers to assure the industry of a continuing supply of uniform graphite products, technological changes in the consuming industries, fluctuations in the general world level of economic activity, and strategic factors.

The better domestic flake graphite deposits in the U.S. are neither exceptionally high nor exceptionally low in tenor. In general, they average from 2 to 8 per cent flake graphite. Though flake graphite deposits in Madagascar have been reported to yield ore containing as much as 60 per cent flake graphite, ore carrying as little as 4 per cent has been worked. The low cost of labour in Madagascar is often cited as an important factor; however, it is not clear to what extent this has been the case. Part of the differential in labour costs may be offset by the great mechanization of American mines.

The history of the domestic graphite industry has been marked by a long succession of failures. A domestic producer newly entering production is thus faced with a long and difficult struggle to convince potential consumers of the quality of his products, and second, of his ability to furnish steady supplies of uniform materials.

The market for graphite in the U.S. is small. Since 1940 consumption has ranged from 30,000 tons to peaks of 63,000 tons in 1948 and 1951. The totals for both the latter years, however, include about 35,000 tons of amorphous graphite from Mexico. Even if a domestic operator were able to furnish graphite of every grade required by industry and just the right proportions of the various grades, his potential market would not be very great. Actually, no operator is able to produce all these grades. Moreover, the strong competitive position of amorphous graphite from Mexico, which in 1956 sold for $9-$18 a tonne f.o.b. Mexico, suggests that the domestic producer cannot hope to capture any sizeable part of this market so long as the Mexican supply continues to be available at low prices.

The incentive towards large investment and toward the extended research and sales effort necessary to develop acceptable products and find markets for them is therefore not great.

THE CYNHEIDRE COAL PROJECT

THE task of reconstructing the British coal mining industry has been proceeding since 1947 and, as part of this programme, 24 new shafts have been sunk and are in operation at long-established collieries. Six collieries, previously closed, have been reopened and equipped with modern plant and facilities. Of these, four are in South Wales. In this period six large new collieries in Great Britain have commenced coal production and of these Cynheidre Colliery is the first in South Wales.

These points were presented by Mr. H. E. Collins, N.C.B. Member for Production and Reconstruction, at the commissioning of Cynheidre Colliery, on November 17, 1960. The decision of the National Coal Board to develop the anthracite underlying the Gwendraeth Valley by sinking and equipping the new Cynheidre Colliery is an important undertaking which, with its modern facilities, marks a new era in anthracite production and will provide opportunities never previously available in the anthracite field. An article describing the Cynheidre coal preparation plant will appear in a subsequent issue.

Cynheidre is situated five miles north of Llanelly in the No. 1 (Swansea) Area of the South-Western Division of the National Coal Board. The project has been designed to have a capacity of 4,000 tons of saleable coal per day when fully developed and is intended to give continued employment for many years to come in this part of the anthracite coalfield.

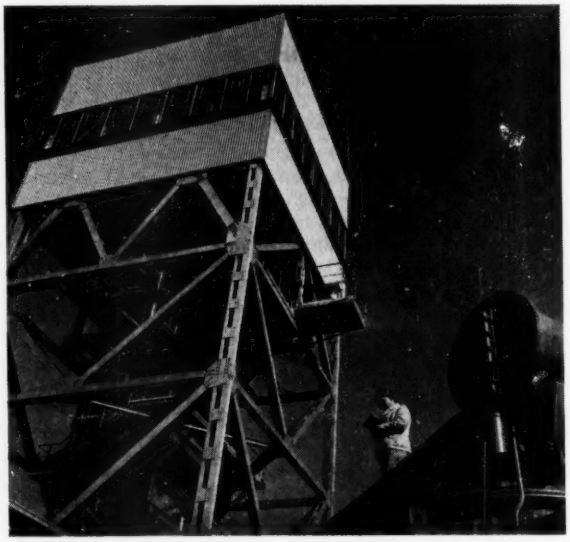
To enable the reserves to be worked, two new concrete lined shafts (Nos. 1 and 2) were sunk on the main site to a depth of approximately 800 yds., and an existing shaft (No. 3) some 3½ miles from the main site was deepened 160 yds. Preparations are in hand for sinking a fourth shaft at No. 3 end of the project.

The reserves are considerable in eight seams, all of which have been or are being worked in the older collieries which the project is intended to replace. The anthracite coalfield presents severe geological problems because of disturbance of the strata caused by faulting and folding. For these and other reasons a horizon system of mining is to be practised.

Work on shaft sinking undertaken by Schachtbau Thyssen commenced in March, 1954, and was completed in September, 1956. Five pit bottoms have since been constructed, and more than 13 miles of tunnels driven by Thyssen Shaft Sinking Co., the British subsidiary of the German concern. Three horizons have been driven at depths of 490 yds., 560 yds. and 660 yds. respectively, and the insets and connection between Nos. 1 and 2 shafts established at a depth of 760 yds.

In the first instance coal will be mined in seams lying between the 560 and 660 yds. horizons at the main site, and the 490 and 560 yds. horizons at No. 3 site, the build-up in the initial stages being gradual, but this will accelerate as time goes on. It is hoped by 1963 that annual output will have reached about 2,200 t p.d. of saleable coal.

As far as possible full face mechanization will be used so as to take full advantage of modern techniques. Two coal ploughs have already been installed and others are programmed. The coal is loaded by the ploughs on to armoured conveyors, thence by belt conveyors to central loading points into mine cars which are then hauled by diesel locomotives to the shaft bottom. Spotting creepers, pneumatic rams and tilting platforms, interlocked for safety, are employed to charge the mine cars on to the cage.



The new winder tower at Cynheidre Colliery

On the main site all the coal will be handled in the No. 1 shaft which is being equipped with tower winders, the winding engines being built above the shaft, each engine operating a large cage and counterweight. When No. 1 shaft winder is completed, the three-deck cage will carry 12 mine cars, having a total payload of 18 tons. The No. 2 shaft—a service shaft—will be used mainly for stone and materials. The winders are not the normal drum type, but follow Continental practice of friction widing. These are the first of their kind to be installed in the South-Western Division. The No. 3 shaft is mainly for materials, although in the initial stages it has been used for man-riding and development work, while the No. 4 shaft will provide the final man-riding facilities together with final ventilation requirements.

On reaching the surface at the main site the mine cars are tipped on to belts, and the coal is then conveyed to the preparation plant to be washed and graded.

Ventilation is by fan installations, one at No. 2 shaft, the other at No. 3 shaft. When fully developed, 840,000 cu. ft. of air per min. will be circulating in the mine. Two compressors on the main site and three at No. 3 shaft are installed, each 5,000 cu. ft. capacity to supply compressed air for the pneumatic machinery.

The winding engine at No. 2 shaft is push-button operated from a point beside the shaft, and the mine car circuit incorporates automatic equipment, two men only being required to operate the plant. No. 1 circuit, now being manufactured, will also be fitted with automatic equipment. All possible labour-saving devices are also installed at the insets underground, and automatic devices incorporated wherever possible.

MINING MISCELLANY

The Venezuelan Government is shortly to make a decision in connection with the proposed installation by Reynolds Metal of an aluminium plant in the Guayana, according to the Fortnightly Review of the Bank of London and South America. Energy would be supplied by the State hydro-electric plant on the Caroni River.

★

A company has been formed in Surinam under the name of Lawa Goudvelden, for exploration and exploitation of minerals, particularly gold. Directors are R. Armstrong and E. Freeman, president and secretary-treasurer respectively of the Canadian firm of North Shore Goldfields and Mines.

★

The Swedish iron ore industry's exports are estimated at between 19,000,000 and 19,500,000 tonnes for 1960, compared with only 17,700,000, in 1957, a previous record year. Exports in 1961 are expected to be 20,000,000 tonnes. The LKAB and Grängesberg firms report that contracts for 1961 deliveries to Britain are up by some 15 per cent on the 1960 levels, while demands from the German and Belgian steel industry hold the 1960 level. Prices have remained, unchanged, despite keen demand.

★

Mansfeld AG fur Bergbau und Huttenbetrieb, of Hanover, the West German mining firm, have signed a contract with the Tamava mining company of Chile for joint exploration and exploration of copper ore deposits near Andacollo, Chile. The ore reserves, situated not far from the Chilean seaport of Coquimbo, about 1,000 m. above sea-level, are estimated at some 100,000,000 tonnes, copper content being about 1.5 per cent. Further exploration and studies will takes about two years, after which it is hoped to start mining initially 10,000 tonnes of crude ore daily. Mansfeld AG, a 90 per cent subsidiary of the German company Salzdetfurth A.G., is the first German mining company to undertake a major mining scheme in co-operation with a Chilian company.

★

New extensions to the Imperial Chemical Industries' rock salt mine at Winsford, Cheshire, were opened recently. The salt mine is used by 600 British local authorities to keep roads free of ice and snow.

★

The Hungarian newspaper *Nepszabadsag* reports that the Tatabanya Coalmining Trust is now using a hydrocyclone to separate impurities from coal, making it possible to save 80 per cent of the coal, instead of 60 per cent saved by the simple water method previously used. The hydrocyclone is said to use less electricity and less water, and since putting it into operation, the Trust's income has risen by 60,000,000 forints (about £2,000,000).

★

The Israel Mining Industries has announced that I£5,500,000 is to be spent on exploitation of shale deposits in the Makhtesh Rimon area of the Negev desert.

★

The U.S. Bureau of Mines, working with the Idaho Bureau of Mines and Geology, have announced the discovery of a second area of widespread beryllium mineralization in central Idaho. The occurrence is in the Yellow Jacket Mountains, 15 miles west of Cobalt, Idaho, and 80 miles north of the Sawtooth mountains, where beryllium was discovered a few weeks ago. The latest find is on national forest land along the Cathedral Rock Road.

★

Mitsui Bussan Kaisha has announced that eight major Japanese steel mills have contracted to import a sample 100,000 tons of Kianga coking coal in 1960 from Queensland, Australia. Contracts, which would be made if the samples proved satisfactory, would be for the entire output of the mines, which would reach 1,000,000 tons a year, after inland transportation facilities had been improved. Negotiations for the imports of Kianga coal were started two years ago between Mitsui Bussan Kaisha and the Thiess Brothers Pty., an Australian development company which own the mines.

★

Marketable production of coal in South Africa is reported by Barclays Bank D.C.O. to have totalled 31,500,000 tons during the first nine months of 1960. This was 1,400,000 tons higher than the corresponding total of last year. Coal sales at 31,400,000 tons were also up on last year's turnover of 29,400,000 tons, while the value of coal sold rose from £18,400,000 last year to £20,600,000 this year.

★

Tableland Tin Dredging of Australia, suspended dredging operations on November 12 because the water storage dam was empty, a result of unprecedented drought conditions in Northern Queensland.

★

The Spanish firm Asturiana del Cinc has been authorized to double the production capacity of its works at San Juan de Nieva, northern Spain, where annual production of electrolytic zinc is to be raised to 24,000 tons.

★

The Regional Mineral Advisory Council has announced that a survey of tin ore in Rajasthan is to be undertaken by the Indian Bureau of Mines during the government's third plan period.

A large-scale iron ore mining operation is planned for the state of Colima on the west coast of Mexico, following an agreement between Miner Durco S.A. and the National Patrimony Department of the Mexican Government. The Mexican Government may, at their option, participate in the operation up to one-third, and the company, which will be known as Colima Mines, may not export any ore produced. Colima Mines expects eventually to produce 2,000,000 tonnes of ore annually, and reserves are estimated by government geologists at 100,000,000 tonnes of high grade ore.

★

Dr. Cheddi Jagan stated in Georgetown recently that the Reynolds Metal Co. was sending a team of experts early in 1961 to investigate the possibility of increasing the company's bauxite operations at Kwakwani.

★

A big iron ore anomaly has been discovered in the Soviet Republic of Uzbekistan, potential reserves of which are estimated at 300,000,000 tons in the Tashkent and Begovat area alone. These deposits will fully satisfy the requirements of the Uzbek Steel Works. When the second section of this works goes into operation, with an annual production of nearly 2,000,000 tons of pig iron, the republic will be self-sufficient for its supply of steel.

★

The Bolivian Government has declared the Potosi and Oruro Departments of Bolivia "State reserves" and will in future grant exploitation rights only if these are over 10 ks. from existing concessions of the Corporacion Minera de Bolivia.

★

According to the Soviet news agency, *TASS*, a group of Ukrainian specialists have developed a new process for the production of copper, germanium and certain other non-ferrous metals from mineral ores. The process is said to involve only the use of electricity and a common salt solution, no smelting process being required.

★

Representatives of Japanese nickel concerns are negotiating with the Indonesian Government in Djakarta regarding possible Japanese co-operation in exploiting the Sulawesi nickel mines. If the government agrees, Japanese experts are to start a study of the Indonesian deposits immediately.

★

Uranium kernels, containing a considerable proportion of uranium, together with copper, vanadium and other heavy metals, have been discovered on the site of the North German mineral oil and natural gas borings at Schwedeneck and Sterup-Steinfeld in Schleswig-Holstein. The depths of the finds are 1,800 m. at Schwedeneck and over 3,000 m. at Sterup-Steinfeld, but it is hoped that moderate deposits of uranium will be discovered near the surface elsewhere in the state.

★

The Council of The Institution of Mining and Metallurgy invite applications for awards from the income of the G. Vernon Hobson Bequest "for the advancement of the teaching and the practice of geology as applied to mining". One or more awards may be made for travel, research or other objects, in accordance with the terms of the bequest. The amount available in 1961 will be approximately £250. Forms of application may be obtained from the Secretary, The Institution of Mining and Metallurgy, 44 Portland Place, London, W.1, to whom they must be returned by January 31, 1961.

Machinery and Equipment

Eliminating Danger from Diesel Fumes Underground

A new chemical additive, which eliminates the danger of diesel fumes underground, has recently been approved for use by the National Coal Board. Known as Vitasul, the additive is manufactured by the Vigzol Oil Co. Ltd.

During tests carried out on a diesel engine at Tutbury Colliery it was established that the new product, added to diesel fuel, reduced the carbon monoxide danger from exhausts to negligible proportions. The method of testing was by a modern variant of the live canary—yellow P.S. detector tubes in which the crystals blacken on contact with carbon monoxide.

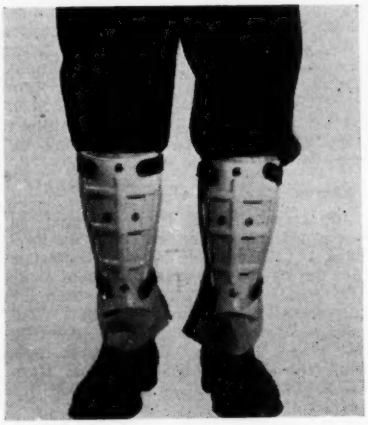
The test is conducted by using an aspirator to draw air into the tube; if carbon monoxide is present the crystals will begin to blacken from the top downwards. The blackened section is then measured and by reference to a chart the safe period for exposure to that air can be ascertained.

In the underground tests at Tutbury a diesel engine, already fitted with a conditioned box, was tested for exhaust carbon monoxide and gave a reading of 15 mm. on the P.S. detector tubes. Transferring this reading to the official chart, it indicated that danger of carbon monoxide poisoning would exist after only half an hour's exposure.

In contrast, when one part of Vitasul was added to 150 parts of diesel fuel, the tube reading showed 2½ mm. or well inside the chart limit marked "safe for prolonged exposure". Following these tests on diesel engines, Vitasul has been approved by the N.C.B. for use underground.

Further features of the additive, which were not subject to the test, are the removal of any unpleasant odour from diesel exhaust and a decrease in fuel consumption through greatly improved atomization.

Above is the A.E.I. flameproof dry-type Class C insulated underground mining transformer. No explosion or fire hazard exists with this type and the equipment holds Flameproof Certificate 4474. Twenty-eight of these transformers are on order from A.E.I. for both U.K. and overseas operations. Alongside, at left, is the Ritex shin bone protector



Cheshire Engineering Co. announce the production of a new rotary table mounted Cheshire Earth Borer, suitable for use in conjunction with the short wheel base Ford Thames Trader 4 x 4 unit. The equipment is shown below. With this new mounting, it is possible to obtain rapid spotting of the auger on piling construction, thereby minimizing vehicle movement. There are obvious applications in opencast mining and quarrying

SHIN BONE PROTECTORS

Heafield Industries announced recently that they had obtained the sole agency in Great Britain for the Ritex shin bone protector, made by Henrich Rohden of Essen. These protectors have met with very great success in Germany, in particular for coal and other forms of mining.

In Germany industrial companies are assessed for accident insurance according to the number and severity of the accidents occurring in their factories each year, and shin bone injuries have proved to require long periods away from work, resulting in a correspondingly high level of sick benefit payments.

The use of Ritex shin bone protectors is said to have cut down the incidence of this kind of injury to such an extent that insurance premiums have been significantly lowered. The Ritex protectors are designed for hard use and long wear in both metal and a specially tough grade of plastic, with leather straps.

Metals and Minerals

Developments in the U.S. Beryllium Industry

Because of its importance in the nuclear field and its promising potential in aircraft and missile applications, beryllium offers exciting prospects for future development, providing the technical and economic obstacles can be overcome.

In an address to the Utah Securities Dealers' Association, Mr. Bruce Odlum, president of Beryllium Resources, Inc., stated that the structural uses for beryllium were almost unlimited, because of the metal's strength-to-weight ratio. Work in Alaska, Utah and elsewhere in the U.S., as well as in other countries, had made it clear that beryllium minerals were present in the earth in sufficient quantities to allow the industry to expand. Beryllium's stiffness, he stated, was almost unbelievable; its weight was negligible. He pointed out that if a DC-7 were made of beryllium, it would weigh only about half what it weighs today. He further stated that, if Britain's gas-cooled reactor at Windscale performed as expected, it would create a demand in the U.K. for between 40 and 100 tons of beryllium annually. This would be equivalent to between 1,000 and 2,000 tons of beryl ore, or nearly 20 per cent of all the beryllium ore consumed in the U.S. today. So far the beryllium industry in the U.S. has doubled every year, on which basis Mr. Odlum predicted that today's $40,000,000 industry would surely be tomorrow's $80,000,000 industry.

Several important developments in the U.S. industry have been reported in recent weeks. The directors of Beryllium Resources Inc. and Dynamic Metals Corp. have voted in favour of merging, the former undertaking to be the surviving company. Beryllium Resources is active in the exploration and development of beryllium ores. Dynamic Metals has developed a new flotation process for the concentration of beryllium. Brush Beryllium Co., one of the two established producers, is to acquire an interest in the surviving company. Last month it was reported that Brush was to build a $3,000,000 plant in Cleveland to expand by 50 per cent its capacity to finish, fabricate and machine beryllium metal. The other established U.S. producer is the Beryllium Corporation, which is joint owner with Imperial Smelting Corporation of the British company, Consolidated Beryllium Ltd. This year the combined sales of the two producers may approach $50,000,000.

The U.S. will shortly have a third beryllium producer, the General Astrometals Corp. of Yonkers, N.Y., which will produce and sell beryllium products under licence from Péchiney, of France. Initially, raw beryllium flake or powder will be obtained from Péchiney, but later on the company may refine ore concentrates. Astrometals expects to start production early next year and will market beryllium metals and possibly other items. It will also produce cermets and ceramics.

The growth of the electronics industry has resulted in an increased demand for beryllium copper strip, which has excellent mechanical properties, coupled with high resistance to corrosion, fatigue and wear. This material can also withstand operating conditions ranging from moderately high to sub-zero temperatures and is thus ideally suitable for missile and satellite projects.

The search for beryllium deposits is becoming more intensified, reports *American Metal Market*, but it is generally going along with a minimum of overinflated ideas, so as to prevent subsequent painful let-downs such as resulted after the uranium boom. The view is expressed, however, that some prospectors may be more optimistic than the situation warrants.

The Bureau of Mines has reported further discoveries of beryllium mineralization on government land in Idaho. It is possible that additional financing for the development of deposits located this year may be forthcoming. Brush is reported to have rights to participate in such financing with Beryllium Resources, Inc.

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Two U.S. firms, Mercantile Ore Corporation and Philip Brothers, offered the highest prices at a government auction of 200 tons of beryllium ore in New York. They bid $345 per ton for ore having 10 per cent oxide content, for 50 and 150 tons respectively. This was the third auction to be held this year and the prices obtained were identical to those paid in a private sale recently contracted with Japan.

LONDON METAL AND ORE PRICES, DEC. 1, 1960

METAL PRICES

Aluminium, 99.5%, £186 per ton
Antimony—
English (99%) delivered, 10 cwt. and over £200 per ton
Arsenic, £400 per ton
Bismuth (min. 1 ton lots) 16s. lb. nom.
Cadmium 11s. 0d. lb.
Cerium (99%) net, £15 0s. lb. delivered U.K.
Chromium, Cr. 99% 6s. 11d./7s. 4d. lb.
Cobalt, 12s. lb.
Germanium, 99.99%, Ge. kilo lots 2s. 5d. per gram
Gold, 252s. 9d.
Iridium, £20/£23 oz. nom.
Lanthanum (98%/99%) 15s. per gram.
Magnesium, 2s. 2½d./2s. 3d. lb.
Manganese Metal (96%/98%) £275/£285
Nickel, 99.5% (home trade) £600 per ton
Osmium, £18/£22 oz. nom.
Osmiridium, nom.
Palladium, Imported, £8 12s. 6d.
Platinum U.K. and Empire Refined £30 5s.
Imported £28¼/£28¾
Quicksilver, £70¼ ex-warehouse
Rhodium, £43/£45 oz
Ruthenium, £14/£16 oz. nom.
Selenium, 46s. 6d. per lb.
Silver, 79¼d. f. oz. spot and 79¼d. f'd.
Tellurium, 28s. 6d. lb.

ORES AND OXIDES

Antimony Ore (60%) basis		21s. 6d./22s. 6d per unit c.i.f.
Beryl (min. 10 per cent BeO)		240s./245s. per l. ton unit BeO
Bismuth		65% 8s. 6d. lb. c.i.f.
		18/20% 1s. 3d. lb. c.i.f.
Chrome Ore—		
Rhodesian Metallurgical (semifriable 48%)	(Ratio 3 : 1)	£15 5s. 0d. per ton c.i.f.
" Hard Lumpy 45%	(Ratio 3 : 1)	£15 10s. 0d. per ton c.i.f.
" Refractory 40%		£11 0s. 0d. per ton c.i.f.
" Smalls 44%	(Ratio 3 : 1)	£13 5s. 0d. per ton c.i.f.
Baluchistan 48%	(Ratio : 3 : 1)	£11 15s. 0d. per ton f.o.b.
Columbite, Nigerian quality, basis 70% combined pentoxides	(Ratio 10 : 1) Nb_2O_5 : Ta_2O_5	175s./176s. per l. ton unit c.i.f.
Fluorspar—		
Acid Grade, Flotated Material		£22 13s. 3d. per ton ex. works
Metallurgical (75/80% CaF_2)		156s. 0d. ex. works
Lithium Ore—		
Petalite min. 3½% Li_2O		50s. 0d./55s. 0d. per unit f.o.b. Beira
Lepidolite min. 3½% Li_2O		50s. 0d./55s. 0d. per unit f.o.b. Beira
Amblygonite basis 7% Li_2O		75s./85s. per ton f.o.b. Beira
Magnesite, ground calcined		£28 0s./£30 0s. d/d
Magnesite Raw (ground)		£21 0s./£23 0s. d/d
Manganese Ore Indian—		
Europe (46%-48%) basis 60s. 0d. freight		73d./75d. c.i.f. nom.
Manganese Ore (43%-45%)		69d./71d. c.i.f. nom.
Manganese Ore (38%-40%)		nom.
Molybdenite (85%) basis		8s. 11d. per lb. f.o.b.)
Titanium Ore—		
Rutile 95/97% TiO_2 (prompt delivery)		£28 0s. 0d. per ton c.i.f. Aust'n
Ilmenite 50/52% TiO_2		£11 10s. per ton c.i.f. Malayan
Wolfram and Scheelite (65%)		148s. 0d./153s. 0d. per unit c.i.f
Vanadium—		
Fused oxide 95% V_2O_5		7s. 6d./8s. per lb. V_2O_5 c.i.f.
Zircon Sand (Australian) 65-66% ZrO_2		£16/£16 10s. ton c.i.f

U.S. GOLD RESERVES BELOW $18,000,000,000

On November 25, the U.S. Treasury announced that the gold reserves had fallen to $17,996,000,000, this being the first time since 1940 that they had been under $18,000,000,000. The latter figure has no economic importance, but is regarded as a "traditional danger" point.

The news had little impact on the dollar price of gold, currently quoted at $35.38½, which, however, persistently remains at a higher level than $35.08¾, the price at which the U.S. authorities are ready to sell to Central Banks. Turnover on the London gold market has fallen sharply. It seems quite probable that the Bank of England is controlling the market at the most economical level and that the demand for gold would rise sharply if the price were to fall below about $35½.

ANTIMONY CONSUMPTION RISES

Consumption of antimony metal and compounds in the U.K. showed a pronounced recovery in September, according to the British Bureau of Non-ferrous Metal Statistics, the monthly total being 450 l.tons against 387 tons in August.

Apart from miscellaneous uses, which were 4 tons lower, and sulphides (one ton lower), all the main trades consumed more antimony.

RESEARCH ON COBALT

At the annual meeting of the Cobalt Development Institute, M. V. Van Vinckenroy, managing director of the Centre d'Information du Cobalt, summarized the results obtained so far in the more important of the research studies in progress. The latter include the development of cobalt catalysts for the complete combustion of motor car exhaust gases. It was stated that, in view of its properties, cobalt seemed likely to provide an adequate solution to the problem of air pollution. This research will therefore be continued, as well as the important investigation on the magnetic applications of cobalt. An appreciable budget will also be devoted to extending the use of cobalt in steels, a field of applications which has witnessed a rapid increase this year. Finally, laboratory and field tests of a new cobalt-chromium-iron alloy will be intensified. This alloy, known as UMCo 50, exhibits excellent wear and corrosion resistance at high temperature.

U.S. OFFER OF TARIFF CUTS

The U.S. has announced a list of 98 imported articles on which it will offer tariff cuts in return for concessions on U.S. products at the Geneva meeting of the General Agreement on Tariffs and Trade (GATT) next year. The reductions offered in U.S. duties, applicable until June 30, 1962, might range up to 20 per cent on a rate basis and up to 50 per cent on an *ad valorem* basis.

As a preliminary to the negotiations with the nations belonging to GATT, the Inter-Departmental Committee on Trade Agreements announced that the U.S. Tariff Commission and the Committee for Reciprocity Information (CRI) would hold public hearings at Washington headquarters on the 98 items beginning on January 5, 1961.

The latest list of articles is a supplemental one. Among the items on it are alumina, barium, boron, strontium, thorium, vanadium, aluminium and alloys, and nickel articles.

URANIUM IN STEELS

A research programme on non-nuclear uses of uranium sponsored by the Canadian Government is reported to hold out considerable promise. An official of the Department of Mines is quoted as stating that the addition of small quantities of uranium could double the strength of steel. Four government agencies are engaged on this project, which has been under development for a year. They are the Department of Mines, the Department of Trade and Commerce, Atomic Energy of Canada, and Eldorado Mining and Refining Ltd. Experiments are in progress to test the anti-corrosive qualities of a steel-and-uranium chain. It is understood that the Canadian Government has already applied for world-wide patents on some of the discoveries arising from this research.

COPPER · TIN · LEAD · ZINC

(From Our London Metal Exchange Correspondent)

In the copper market the firmer undertone persists whilst, in the other three markets, sentiment is definitely less optimistic.

COPPER TO GO HIGHER?

The firmness in the copper market continues and the backwardation tends to widen in spite of a further rise in stocks at the beginning of the week of 595 tons, bringing the total to 12,917 tons. Most experts consider that the rate of increase in stocks will grow less during the next few weeks and that the technical position of the market will cause the backwardation to increase still further with a consequent rise in the general price level. Although the majority still feel that the price will decline after the end of the year some people are now pointing out that if there is a strike at Braden this will affect the sterling price: similarly should the forthcoming Conference in London on the future of the Rhodesias and Nyasaland run into difficulties, there may be rumours of strikes on the Copperbelt which would have an immediate reaction on sterling quotations.

Demand continues good in the U.K. and Europe and during the week the U.M.K. price increased from 28.10 c. per lb. to 28.80 c. per lb., New York or Antwerp. It is understood that Iron Curtain countries are still in the market for the red metal and at the end of last week it became known that the Japanese had made an allocation of foreign exchange in respect of the imports of copper and copper scrap.

In the United States the most active sector of the copper industry appears to be that dealing with export which has in turn helped the custom smelters to maintain their price level of 30 c. per lb.: producer copper is reported as being quiet with indications that the decline in activity will continue through December.

The Copper Association gave the following figures for consumption by U.S. brass and wire mills and foundries in October: 105.223 s.tons as compared with 112.828 s.tons in September: new orders were also lower at 96.118 s.tons as against 117.759 s.tons the previous month. Fabricators' stocks of refined copper also showed a fall at 453,406 s.tons against 465,178 s.tons at the end of September.

TIN DEFICIT IN PROSPECT

The tin market has remained reasonably active with a slight fall in the price level but with the backwardation being maintained. Turnovers in Singapore have been substantial and it seems possible that these may have been caused by a belief that the Finance Minister was considering increasing the tin export duty. In the event an announcement was made last Wednesday which at first sight would suggest that an increase in the export duty will be introduced from January 1 next on a sliding scale, rising to 5 per cent in respect of that portion of the sales revenue derived from sales at a tin price in excess of £780 per ton. The Finance Minister has stated that he expects to gain an additional £200,000 in revenue from this measure which would be equivalent to approximately 65s. per ton of tin in ore.

Although the decreased activity in the motor industries of the world has resulted in some lessening of demand, the majority opinion still appears to be that there is an overall shortage of tin (outside stockpiles) and that eventually the price will move to considerably higher levels. Stocks in official warehouses in the U.K. fell by 92 tons at the beginning of the week to 9,131 tons. On Thursday the Eastern price was equivalent to £798¾ per ton c.i.f. Europe.

THE PROBLEM OF PRODUCERS' LEAD STOCKS

Both the lead and zinc markets have developed a weaker undertone, the latter being helped by the news that the strike at the New Jersey Zinc Co.'s plants had been settled and that full operations would be recommenced immediately.

In the U.K. offtake of lead remains satisfactory and there does not appear to be too much metal on the continent of Europe but in America complaints are heard that foreign lead imported under the quota is being sold at prices considerably below the existing American level of 12 c. per lb. New York.

The major problem in this country is the large stocks held by producers and from time to time remarks are made in that quarter that continuation of the present restriction in availability to the market cannot be continued after the next meeting of the Lead Zinc Committee in the spring of 1961.

ZINC HIT BY CAR SLUMP

Zinc demand has been materially affected by the trouble in the motor industry, and although in the U.K. there does not appear to be any surplus of metal, it is known that in Germany holders are finding difficulty in selling their stocks at a satisfactory price in relation to the L.M.E. quotation.

In America, stocks are still on the increase and the settlement of the strike referred to above will increase the rate at which, especially G.O.B., zinc is accumulating. The Bunker Hill Co. strike continues and it is now known that an election will be held on December 10 to determine which of two unions will take over the bargaining so that no recommencement of work seems possible before the new year. Closing prices are:

	November 24		December 1	
	Buyers	*Sellers*	*Buyers*	*Sellers*
COPPER				
Cash	£228¼	£228½	£231½	£232
Three months ..	£226½	£226¾	£228¼	£228½
Settlement ..	£228¾		£232	
Week's turnover	12,900 tons		11,075 tons	
LEAD				
Current ½ month	£67⅛	£67½	£66⅝	£66½
Three months ..	£68⅛	£68¼	£67⅛	£68
Week's turnover	5,450 tons		7,125 tons	
TIN				
Cash	£801	£801¼	£799½	£800
Three months ..	£798	£798½	£797½	£798½
Settlement ..	£801¼		£800	
Week's turnover	435 tons		420 tons	
ZINC				
Current ½ month	£87¼	£87½	£86	£86¼
Three months ..	£86¼	£87	£85⅝	£85¾
Week's turnover	4,925 tons		6,325 tons	

Mining Finance

How to Raise £100,000,000

Consolidated Zinc Corporation, the Australian lead-zinc producer which also owns Imperial Smelting in the U.K., has wasted no time in pushing forward its plans for the £100,000,000 scheme to establish a 148,000 tons per annum aluminium industry in Australia and New Zealand. Its partnership with British Aluminium in this project was dissolved as recently as last September. Now it has negotiated a fifty-fifty link-up with the big American concern, Kaiser Aluminum and Chemical Corporation, which will take up half the shares in a new company to be formed to acquire the interests of Commonwealth Aluminium Corporation (Comalco) at present wholly-owned by Consolidated Zinc.

The scheme is scheduled for fruition by as early as mid-1966. In the meantime, the great question for Consolidated Zinc shareholders is how the money is going to be raised and what effect it will have on their dividend prospects in the intervening period. Firstly there is to be no new equity capital, at least for the time being. The Consolidated Zinc directors, headed by Mr. L. B. Robinson, reckon that they can provide £10,000,000 from group earnings and still pursue a "progressive" dividend policy from existing operations, although it is admitted that much will depend on the course of the market for lead and zinc.

Another £10,000,000 is to come from an issue of Loan stock to the British South Africa Company and "certain close associates". It will carry interest at 5½ per cent and also what is in essence a conversion right into Consolidated Zinc £1 shares at 87s. 6d. exercisable after July 1, 1966. Present price of the shares is 65s. 6d.

Of the remaining £80,000,000, Kaiser is to provide £20,000,000 and it is proposed to raise the other £60,000,000 by what, by mining industry standards, should be a very remarkable operation, namely a Loan stock issue by Comalco's new holding company. It is apparently felt that this is the cheapest way to obtain such a huge sum of money. Just to round the deal off it is worth mentioning that there is also a cash payment involved of $3,500,000 (about £1,250,000) from Kaiser to Consolidated Zinc. Some of the broader implications of the project are discussed on page 627.

Consolidated Zinc shares went up sharply ahead of the announcement, reaching 71s. 10½d. at one time, but the actual news was greeted by a setback to 65s. 6d. at which the yield on the 4s. paid for 1959 is 6.1 per cent. There should be no doubt about this payment at least being repeated for 1960. The interim was recently maintained at 1s. 3d.

From a long-term investment point of view shareholders have to realise that by the end of the decade the company's fortunes should, if all goes well, be more geared to aluminium than to lead and zinc. Aluminium is a metal with expanding uses. The president of Kaiser, Mr. D. A. Rhoades, has forecast that consumption in the Pacific area will have more than doubled by 1970.

In the meantime, the outlook for lead and zinc is currently a little cloudy, the former metal being in sufficient over-supply for the producers to be operating a cutback scheme while both stand well below the levels reached earlier in the year. Lead is currently £66½ a ton compared with a 1959 average of £70 and a 1960 peak of £78. Zinc stands at just under £87 against the 1959 average of £82 and a top earlier in the present year of £95. In the short term the movements of Consolidated Zinc will probably continue to be linked to the course of industrial activity in Europe, the U.K. and America.

WHAT IT MEANS FOR CHARTERED

For Chartered the participation in this venture represents a really major breakaway in its investment programme from the African scene. As is well known, Chartered is engaged on building up a huge investment portfolio against the day in 1986 when its present chief source of revenue, the royalties on copper production in Northern Rhodesia, will be taken over by the Government there.

Chartered will not have to find the £10,000,000 for Consolidated Zinc all at once. There will be two instalments of 12½ per cent each on January 1 and July 1, 1961, and three instalments of 25 per cent each on July 1 in 1962, 1963 and 1964. Last year Chartered appropriated £2,000,000 from its profits for investment, the year before that £1,500,000. The preliminary profit statement and final dividend for the year to Sept. 30, 1960, are due in February.

Chartered 15s. units stand at 71s. compared with close on £6 in the early part of the year before Central African political fears brought them back with a run. The company had a very good year in 1959-60 as detailed here on November 11 and the dividend should be at least maintained at 6s. to make the yield 8.4 per cent.

CASTS TO SELL ON ACCRA MARKET

The dividend, profits and proposed free share issue by Consolidated African Selection Trust, the Sierra Leone and Ghana diamond producer in the Selection Trust group, were commented on here a fortnight ago. Now comes the very informative annual report for the year to June 30 last. In it there is a graphic illustration of how over the last decade the company's production from Ghana has outstripped that from Sierra Leone. Last year 1,279,839 carats were produced from Ghana compared with only 702,384 carats from Sierra Leone. Moreover, the overburden moved and gravel treated to obtain the Ghana stones were far less than those in Sierra Leone.

The large Ghana caratage assumes particular importance at the moment because a vital alteration in marketing arrangements is pending. Up to now Casts has sold its diamonds to De Beers' Central Selling Organisation which is the channel through which most of the world's rough stones reach the diamond merchants. The C.S.O.'s contracts with producers come up for their five-yearly revision at the end of this year. It looks as though Casts will be renewing theirs for only the Sierra Leone part of their production.

It has been decreed by Dr. Nkrumah that all Ghana diamond mining companies will have to sell their output through Accra's own market once their current sales contracts have expired. Talking about this market the Casts chairman, Mr. A. Chester Beatty, says that it has been in operation for seven years and "has proved to be a success". The impingement thereon of Casts production will virtually double the volume of business and the market, Mr. Beatty thinks, may take a little time to settle down. But, although prices will naturally fluctuate, Mr. Beatty expects that on average the company will not obtain

LONDON MARKET HIGHLIGHTS

South African gold shares moved rather indeterminately during the week, despite news of the fall in the U.S. gold stock to below the "danger" level of $18,000,000,000. Such buying interest as there was centred on the Finance group. It followed Johannesburg talk that another Kaffir finance trust designed to carry a direct appeal to the U.S. investor was in process of being formed. Rand Selection were particularly linked with these rather vague rumours and a persistent Cape demand carried the shares 2s. 6d. to 61s. 3d. before a reaction to 60s. Also dearer were Union Corporation (68s. 6d.) and Gold Fields (71s. 6d.), but Anglo American remained noticeably dull at 165s. 7½d.

Other issues tended to give ground in extremely quiet trading. There were occasional weak features, Hartebeest being especially depressed with a tumble of 4s. to 48s. 9d. on the chairman's confirmation that a dividend cut is in prospect. Eastern Rand Extensions, 1s. 3d. down to 19s. 9d., were not helped by the decision to discontinue the disappointing O.F.S. drilling operation on farms Video 305 and Vermeulenskraal Noord 480 to the south of President Steyn.

Another factor depressing Eastern Rand Extensions was the dullness of the company's Buffelsfontein (40s.) and New Pioneer (34s. 4½d.) shareholdings.

There was not a great deal of interest in the base metal sections, but at least the Rhodesian copper group managed to stage a revival. The move stemmed from a slightly more optimistic view being taken of the Rhodesian political situation coupled with the firmness of the metal price. Actual demand for shares was small but it made quite an impression in a market short of stock. Nchanga jumped 1s. 10½d. to 48s. 9d. while Rhokana (45s. 7½d.) and Rhodesian Anglo American (55s. 7½d.) were each 1s. 3d. better.

The tin group tended to ease a few pence here and there, mainly through lack of business. Ampat (12s.) and Southern Kinta (25s. 9d.) improved slightly following the higher interim payments which had not been anticipated by the sharemarket.

After their recent rally, Australian issues began to fall back again. Consolidated Zinc were a particularly disappointing market; prior to the news of the aluminium link-up with Kaiser Aluminum and Chemical the shares had climbed to 71s. 10½d. but last week's announcement was immediately followed by profit-taking which culminated in the shares falling back to 65s. Mount Isa drooped to 45s. and New Broken Hill were also a dull market at 39s. 6d. The movement spread into the gold section where Lake View fell to 29s. 6d

less than it has been receiving under existing arrangements. He quite rightly points out that for both the Ghana and Sierra Leone Governments it is essential that the two operating mines receive the maximum price for their production because "obviously both the profitability and the life of the mines depend on it".

Mr. Beatty reckons that diamond sales through the C.S.O. for 1960 will be in the region of £87,000,000, only a small reduction on last year's record £91,000,000. So the company at the moment faces a good prospect, which is only likely to become clouded should the recession in America really gather pace. Casts 5s. shares at 22s. 6d. ex dividend offer a yield of over 15 per cent on the 3s. 6d. paid for 1959-60. The proposed one for two share distribution (*M.J.* November 18) is to be submitted for shareholders' approval at the meeting on December 21. When made effective it will reduce the price of Casts to 15s., and there could, if all goes well, be some stepping up of the proportionate dividend for 1960-61.

HARTEBEEST TO CUT DIVIDEND

It had been hoped that Hartebeestfontein, the Klerksdorp area gold and uranium producer in the Anglo-Transvaal group, would be able to escape a further cut in its dividend. But this is not to be so the chairman, Mr. B. L. Bernstein, revealed at this week's meeting in Johannesburg. He said that as a result mainly of the large amount which must now be paid by way of taxation and share of profits to the state it was unlikely that the dividend could be maintained at the same rate as in 1959-60. Future payments, he added, would depend largely on results obtained in the deeper area of the mine as it was opened up.

This hit the market in Hartebeest amidships and the 10s. shares dropped to 48s. 9d. at which the yield on the present 6s. dividend rate is 12.3 per cent before allowing for double tax relief. It thus looks as though a cut to, say, 5s. is already being discounted.

The mine's deeper area about which there was a good deal of doubt at one time continues to belie this pessimism. The ore being drawn from this area now amounts to 45 per cent of the whole. As already announced here, Hartebeest is sinking a new shaft in the south-western part of its property and set up a world sinking record therein during October. Mr. Bernstein says a further shaft system will eventually be necessary in the north-western part of the mine and work on this should start in 1965.

The Chairman's address is reported on page 641.

PAHANG'S LEASE NEGOTIATIONS

The results of Pahang Consolidated, which produces tin from a Malayan lode mine, were commented on here on November 11. The full report reveals that in the year to July 31, 2,252 tons of tin concentrates were produced and 2,206 tons exported. In the September quarter of the current year sales were at the higher rate of 646 tons and should be greater still in the current quarter during which export quotas under the International Tin Agreement have been taken off.

Unfortunately the chairman and managing director, Mr. J. N. Davies, does not give any indications in this respect in his annual review, but it will be surprising if he is not able to be quite optimistic about 1960-61 prospects at the meeting in London on December 15. The company's subsidiary, Kuala Reman Rubber Estates, is to repay 1s. 6d. a share of its capital which will bring in £135,000 to Pahang. This, it is stated, will be put to general and development reserve.

Mr. Davies naturally touches on the question of Pahang's mining lease which expires in 1968. He says that negotiations with the Malayan Government have been in progress for some time and he hopes before he addresses shareholders again that the matter "will have been taken to a stage at which it will be possible for me to place before you plans for the future working of your properties". Pahang 5s. units are 9s. 6d. to yield 9.5 per cent on last year's 18 per cent dividend.

UNITED TIN NEEDS TO BOOST OUTPUT

United Tin Areas of Nigeria produces columbite as well as tin so it staged a recovery in the year to last March and instead of a loss of £7,987 it made a profit of £10,257 and was able to return to the dividend list with a payment of 7½ per cent on the 2s. 6d. shares, the first since 1955. Another important factor was that in September, 1959, an amalgamation was effected with Ribon Valley (Nigeria) Tinfields. Actually the present accounts cover a full year of combined operations because the amalgamation was made retrospective to the beginning of the 1959-60 financial year.

In the present quarter, and also most probably in the last quarter of the year to March next, the company will be having the benefit of unrestricted tin output. The chairman, Mr. A. Hedley Williams, in his review that accompanies the report does not venture any opinion about 1960-61 prospects, but he will presumably do so at the meeting on December 14 by which time nearly three-quarters of the period will have been completed.

The company has been expanding its tin output. The total for the first seven months of the year is 137 tons against 95 tons. But only 15½ tons of columbite have been produced compared with 20½ tons in the same period of 1959-60. Against this Mr. Williams says that 5½ tons from stocks have been sold since March 31 last. United Tin's Odegi areas are being prospected with a view to increasing production, but this investigation "will probably take a year or more". United Tin are quoted at 2s. ex dividend to yield 9.4 per cent. They could be responsive to any news of higher columbite output.

FINANCIAL NEWS AND RESULTS IN BRIEF

Kepong Dredging's Better Showing—Kepong Dredging Company's net profit after tax for the year to June 30 last was only £2,376 which in itself would not have justified the resumption of dividend payments with the 3d. per share distribution which is now proposed. This recommendation however, should be read in conjunction with the news that the company's dredge is now working normally and that working profit for the first four months since the end of the last financial year is estimated at approximately £30,000.

London and African Pays Same—London & African Mining Trust's working profit for the year to June 30 last amounts to £38,855 (£20,392). The proposed dividend distribution remains unchanged at 12½ per cent and after transferring £15,000 to investment reserve, the carry forward is some £5,000 up at £23,650. The investment reserve, which now stands at £60,000, relates to the Trust's interest in the Mines Development Syndicate's lead-zinc property in Eastern Nigeria. In his annual review, the chairman refers to the efforts which are being made to find the capital needed to bring the mine into production. It is understandable that this property should remain of problematical interest to risk capital at present lead-zinc prices, but may it not prove to be the kind of property which the newly-independent Nigerian Government might be interested to see developed as a valuable indigenous resource?

Amalgamated Tin Columbite Sales—Describing the demand for columbite as satisfactory, the chairman revealed at this week's annual meeting that the company was sold out to the end of 1961. It is understood that this refers to accumulated stocks as well as current production.

Chenderiang's Outlook—In his annual statement to shareholders (see page 642) the chairman, Mr. Jack Addinsell, in referring to the company's progress since the end of the financial year to March 31 last states that ore sales have been running at 110½ tons for the first six months of the current year as against 53 tons a year ago. Although, due to non-recurring mining expenditure, a working loss has been suffered in this period, he thinks that having regard to the suspension of export control, the final results for the current year may not be unsatisfactory.

Good President Steyn Borehole—President Steyn reports that Borehole KP.11 (about 4,300 ft. due east from KP.10 and 8,500 ft. south of the No. 2 shaft) has intersected the Basal Reef at 6,703 ft. The core assayed 70.7 dwts. over 8.9 in. (6.29 in.-dwts.). On deflection a similar result was obtained and a further deflection is being made. The significance of this result is that it is the first relatively high value obtained from drilling at the southern end

Ipoh Raises Dividend—Ipoh Tin Dredging reports a net profit before tax for the year to March 31 last of £54,162 (£21,185). Tax is estimated at £24,310 (£7,793). A dividend of 3s. per share gross is recommended against last year's distribution of 1s. and a distribution of 2s. in each of the preceding years. Meeting, December 21.

Sungei Way Increases Final—Sungei Way Dredging recommends a final dividend of 10 per cent, raising the distribution for the year to June 30 last to 15 per cent as against 7½ per cent in the preceding year.

Temoh Tin—This property continues to be worked on tribute, and reports a net loss for the year to June 30 last of £1,930 (£1,216). It will be recalled that the company made a repayment of capital of 2s. 6d. per stock unit last August.

Mountain Copper's Capital Increase—An extraordinary general meeting of the Mountain Copper Company this week unanimously resolved that the authorised capital be increased from £750,000 to £900,000 by the creation of 500,000 new shares of 6s. each. It is now the Board's intention to offer these new shares as a rights issue at 10s. per share on the basis of one new share for every five held.

HARTEBEESTFONTEIN

(Incorporated in the Union of South Africa)

MR. B. L. BERNSTEIN ON PROGRESS OF COMPANY'S DEVELOPMENT PROGRAMME

The eleventh Annual General Meeting of Hartebeestfontein Gold Mining Company Limited was held on Tuesday in Johannesburg, **Mr. B. L. Bernstein** (the Chairman), presided, and, in the course of his speech, said :—

The Directors' Report and Accounts, the Technical Advisers' Report and my Review of Operations for the previous financial year, which have been circulated to members, and which are before you now, give a comprehensive survey of the Company's operations.

Excellent progress has been made in the sinking of No. 4 shaft. During October the shaft was sunk 1,106 feet, which was a record footage for any one calendar month for a shaft of this size. By Tuesday morning it had been sunk a further 752 feet and was 2,657 feet below the collar. Sinking has not been as fast during November as during October owing to rather more difficult ground encountered. This high sinking rate should materially advance the date when a holing on the 29th level can be effected and additional ventilation facilities can be provided to meet the expansion of operations in the deeper area of the mine. Careful planning, improved techniques and the use of better equipment has enabled the rate of shaft sinking to be almost doubled in the past five years. The fast sinking rate in this shaft can be largely attributed to effective precementation and to the use of new hydraulic lashing equipment with its thirty cubic feet capacity grab and bigger kibbles. In order to obtain the maximum use of this equipment larger diameter drill steel and more powerful explosives are used. Fewer holes are thus needed to break the rock resulting in reduced drilling and blasting times. Enthusiastic, efficient and well organized teams, working in close conjunction with suppliers of materials and equipment, are essential to the attainment of the high speed of sinking.

Since the end of September 6,245 feet of development in the deeper area of the mine have been sampled, of which 81.6 per cent was payable at 428 inch-dwts. and 24.22 inch-lbs. During this period 2,310 feet were sampled in the shallow area of which 87.0 per cent was payable at 405 inch-dwts. and 38.23 inch-lbs.

The 29th level haulage, which will connect with No. 4 shaft at a depth of 6,400 feet below the surface, had advanced to within 1,190 feet of the shaft on Tuesday. It is expected that a holing will be accomplished in approximately five months.

Record Tonnage Mined

During the month of October the tonnage mined increased to the highest figure for any one month. Excluding shaft sinking a total of 227,000 tons were mined of which 45,000 tons represents waste rock from development. Of the 182,000 tons broken for milling 62,000 tons (or 34 per cent) were sorted out as waste, of which 14,000 tons were packed in stopes and 48,000 tons were sorted on surface leaving 120,000 tons for milling. The narrow reef widths so far encountered have enabled this high sorting rate to be maintained. Extensive faulting encountered in the mine and the fact that it is possible to discard so much of the tonnage broken for milling makes it unlikely in existing circumstances that the milling rate will be increased beyond 130,000 tons per month.

The amount of ore drawn from the deeper area has now increased to 45 per cent of the total tonnage hoisted for milling. Hoisting from a greater depth has increased working costs.

Due to the major fault which traverses the lease area and the resulting disposition of the reef it has so far been necessary to sink four main shafts and one small ventilation shaft. A further shaft system will be required in the north-western portion of the mine and it is presently expected that a shaft to serve this area will be commenced in 1965.

As a result, mainly of the large amount which must now be paid by way of taxation and a share of profits to the State, it is unlikely that the dividend can be maintained at the same rate as in the 1960 financial year. Future payments must depend largely on the results obtained in the deeper area of the mine as it is opened up.

The motion for the adoption of the Directors' Report and Accounts was carried unanimously. The retiring Directors Messrs. R. B. Hagart, L. P. Kent and R. F. Lapping were re-elected and the Auditors' remuneration was fixed.

Personal

The N.C.B. announce that they have appointed Mr. G. McLaren as industrial relations director of their Scottish Division, where he is currently a deputy-director of industrial relations. He succeeds Mr. L. R. Milligan, who became deputy chairman of the Scottish Division in September this year.

*

The Skefko Ball Bearing Co. of Luton, announce that Mr. A. I. Helm, hitherto the company's plant engineer, has been appointed works manager of the company's proposed new factory at Irvine, Ayrshire.

*

Following the retirement of Sir Samuel R. Beale, Mr. P. B. H. Brown has been appointed chairman of Worthington-Simpson Ltd.

*

Caterpillar Tractor Co. announce the appointment of Mr. G. Bryden as district representative to work with the Caterpillar dealers in Scotland and Ireland, and Mr. John Rogers as district representative to work with dealers in England. Mr. Terry Quadling has been appointed earthmoving representative for the company.

*

Mr. A. E. Bell and Mr. R. Lancaster have been appointed to the board of Distington Engineering Co., Ltd., a subsidiary of The United Steel Companies. Mr. Bell becomes director and the commercial manager, and Mr. Lancaster becomes director and general works manager.

*

Caterpillar Tractor Co. have announced that Mr. W. J. Bornholdt, vice-president of the Caterpillar foreign trade group, and formerly managing director of the company's British subsidiary, has been appointed president of the new French subsidiary, Caterpillar France S.A. Mr. W. W. Sellers, who has been quality control manager of the firm's Glasgow factory, has moved to France to work with the new company.

Company News

Walker Brothers (Wigan) Ltd., and John Wood and Sons Ltd. have been amalgamated, and will trade under the name of Walmsleys (Wigan) Ltd. Manufacturing operations will be continued as heretofore at Pagefield Works and Barley Brook Works, but correspondence should be addressed to Walmsleys (Wigan) Ltd., P.O. Box 9, Wigan.

*

It has been announced that the offer made on behalf of Laycock Engineering for the Preferred and Ordinary shares of Hardypick Ltd., has now become unconditional.

*

An agreement has been announced between Alco Products, Inc. (formerly American Locomotive Co.), of New York, and Davey Paxman and Co., of Colchester, a member of the Ruston Group. Under this agreement the firms will collaborate on diesel engine design and manufacture for world markets, Paxman being able to manufacture and sell Alco diesel engines outside the U.S., while Alco will make and sell Paxman engines in the U.S.

*

A new Portuguese rock tunnelling record is announced by MAGOP, in the Cavado Rabagao tunnel of the Alto Rabagao hydroelectric scheme, where the average daily advance was 8 m. (26 ft. 4 in.). Drilling is being done with Holman Silver Three Handrils, mounted on Holman 52 in. Airlegs.

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NORTH KALGURLI (1912) LIMITED

A BETTER YEAR

MR. H. A. KEMLO'S STATEMENT

The Annual General Meeting of North Kalgurli (1912) Limited was held on November 30 at Winchester House, Old Broad Street, London, E.C.2, **Mr. H. A. Kemlo,** the chairman, presiding.

Mr. S. L. Crawford, the Secretary, read the notice convening the meeting and the report of the auditors.

The following is the statement by the chairman which had been circulated with the report and accounts for the period ended March 29, 1960 :—

Last year, on the occasion of Mr. C. T. Ley's retirement from the Board, I referred to the great services which he had rendered to the Company over a period of thirty-one years, during fifteen of them as Chairman of the Company. You will be sorry to hear that Mr. Ley did not live to enjoy his retirement for long. He died on April 22, 1960, and his passing is very much regretted by his former colleagues, as indeed by all who knew him.

In the 52-week year of 1959-60 we did rather better than in the 54 weeks of 1958-59, treating 367,511 tons of ore to produce 87,030 ounces of gold, against 361,213 tons producing 84,770 ounces. We also treated 1,289 tons of stored concentrates producing 3,141 ounces of gold. Silver recovery was £7,432 as compared with £3,807 in 1958-59. Our gross mining income, after allowing for the reduction in the concentrates stockpiled, was £1,102,780 against £1,075,027 for the previous year, and our net profit was £169,215 against £162,827.

It is proposed to repeat the same final dividend of 6d. a share, making 10½d. for the year. The carry forward of £57,196 shows an increase as compared with last year.

The Balance Sheet reflects little change, but I should mention that the payment of the interim dividend on March 31, 1960 (after the end of the financial year) accounts for the difference when comparing the amounts for U.K. Taxation, Dividends payable and Balance at Bankers with those of the previous year.

Development

Last year I gave you a comprehensive review of development prospects, both short-term and long-term. Nothing has happened during the last twelve months to alter this assessment. A total of 15,581 feet of development work was carried out during the year, covering a wide range of objectives throughout the Croesus, Main, and Kalgurli Shaft workings, and the overall development results are reflected by the ore reserves which are now estimated at 2,299,378 long tons averaging 5.39 dwt. as compared with 2,283,266 tons averaging 5.42 dwt. Developments of particular interest are a high grade cross lode and subsidiary ore lenses at Nos. 21 and 22 Levels of the Kalgurli Shaft, and profitable ore West of Main Shaft at No. 18 Level; these are the deepest mine horizons on which development is in progress and they are in calc schist.

During the early part of the current financial year we had some operational difficulties, due to bad ground, on two of our large high-grade stopes, the No. 9 Level Cutcliffe Lode Cut and Fill Stope on the Main Shaft, and the No. 9 Level Main Lode on the Croesus Shaft, which for some time had the effect of lowering the grade. The difficulties were dealt with, and we have been mining normal average grade ore, or better, since the end of July, but the temporary drop in grade will have some effect upon the profits for the year.

Wage rates continue their upward trend. In May of this year the State Arbitration Court granted to workers in the gold-mining industry an increase of 28 per cent in the margins payable over and above basic wage rates, and in July the basic wage was itself increased. The increases will cost us something like £20,000 a year, except in so far as we can offset them by further economies. For many years we have countered the constant inflationary trend by paying the strictest regard to economy and efficiency, but there is a limit to what can be done in that direction.

Power

In June of this year our General Manager, Mr. Frank Davis, visited us in London, and we had invaluable discussions with him about the power problem which I spoke of last year, and about Mine affairs generally. We are very much indebted to Mr. Davis, and to all our Executives, for their constant concern for the prosperity of the Mine, and our thanks are due in particular this year to our Engineering Staff who have done excellent work in producing plans for the installation of our own Power Plant.

Within the last few months the Kalgoorlie Electric Power and Lighting Corporation have put forward a scheme for the modernization of the Power Corporation's Generating Plant designed to enable the Corporation to supply power to its mining consumers at a considerably reduced price. The scheme contemplates that we and the other Mining Company concerned will make substantial contributions, by way of loan, towards the capital cost of the scheme. As our contribution (which can be met out of our existing resources) would be smaller than the amount which we should have to spend if we were to install our own Power Plant, and as our savings in power costs should be comparable with those which we should achieve by generating our own power, we favour the scheme in principle, and we shall try to bring the negotiations to a satisfactory conclusion.

In the meantime the Power Corporation has agreed to give us a rebate on power charges at the rate of £22,500 sterling per annum.

The report and accounts were adopted and the payment of a final dividend, as recommended, was approved.

The retiring director, Mr. F. G. Wright, was re-elected and the remuneration of the auditors, Messrs. Barton, Mayhew & Co., having been fixed the proceedings terminated.

CHENDERIANG TIN DREDGING

The Forty-sixth annual general meeting of Chenderiang Tin Dredging, Ltd., was held on November 25 in London, **Mr. Jack Addinsell,** chairman, presiding.

The following is an extract from his circulated statement for the year to March 31, 1960 :—

As a result of the increasing rates of quota and the continued acquisition on an agreed basis of additional quota from some of the other mines within the General Managers' group, which had closed down owing to tin restriction, ore sales of 147 tons were possible, an increase of 66 tons over 1958/59. Nevertheless, although the Kris Section was in operation throughout the year it was still necessary to close down the Sungei Lah Section for 119 days. The improvement over 1958/59, which was in evidence when we met last year, was maintained and as a result there was a profit before taxation of £8.928 against a loss of £6,620. Your directors feel justified in recommending a dividend of 10 per cent.

Production during the current year has been maintained at a satisfactory rate and ore sales for the first six months amounted to 110½ tons as against 53 tons for the same period of the year under review. However, a loss was suffered due to non-recurring mining expenditure in this period. Nevertheless, shareholders will be aware that export control has been suspended as from October and, provided the current tin price is maintained, it is reasonable to expect that the final results for 1960/61 may not be unsatisfactory. The report was adopted.

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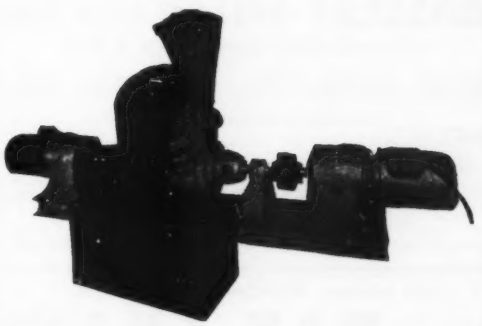

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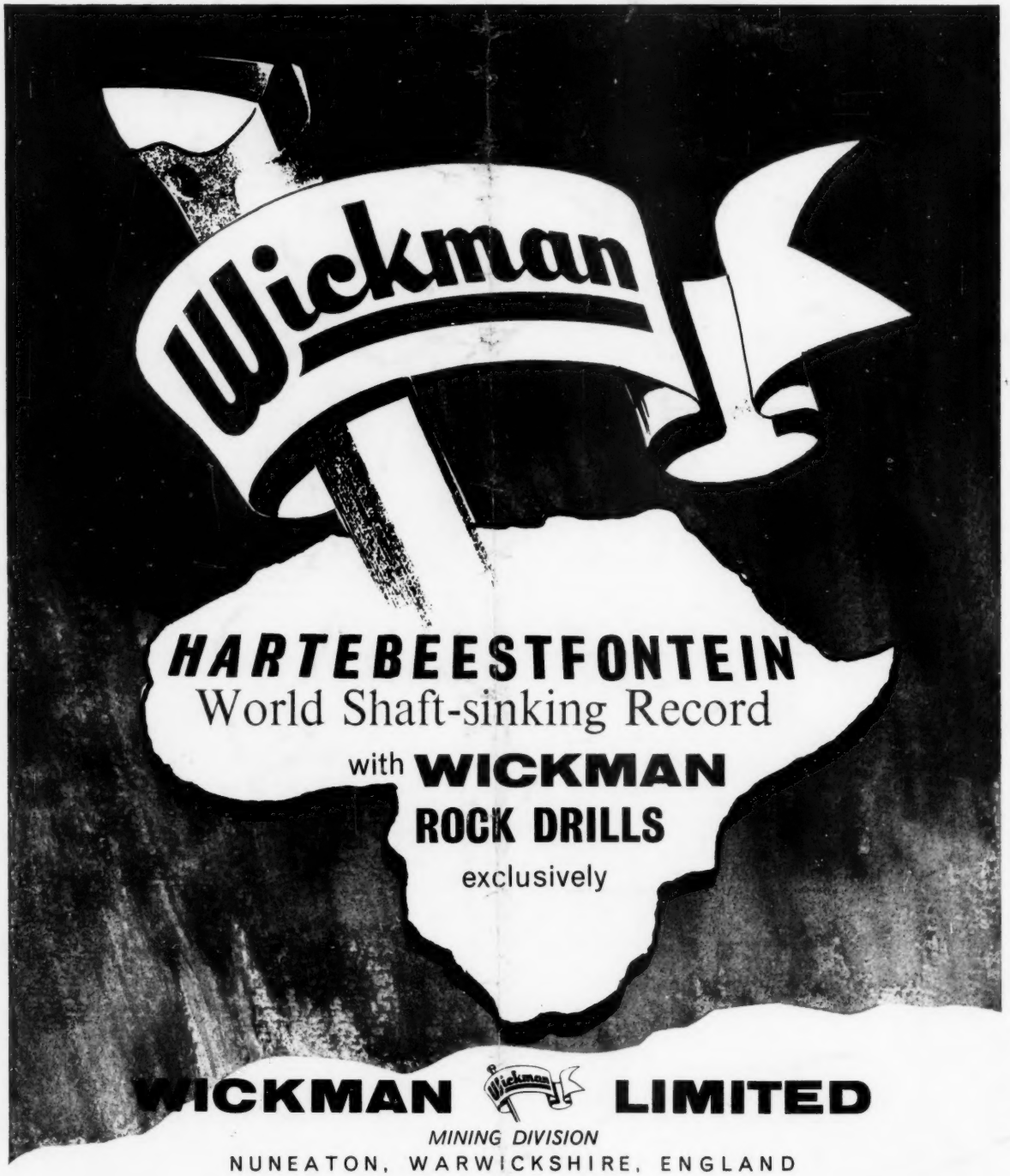

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